LIBERAL ARTS in ST. THOMAS AQUINA

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THE LIBERAL ARTS IN ST. THOMAS AQUINAS

TODAY there is a common tendency to identify the classical notion, "the liberal arts," with another ancient notion," the humanities." To many the term "art" suggests an ability which is "creative," imaginative, free of any rigid standards of objectivity or narrow precision. It implies the intuitive, the emotional, the "existential response" of the "whole man." The term "liberal" seems merely to emphasize these connotations by indicating that the practitioner of such arts must be open-minded, tolerant of discussion and debate, generous and sensitive to the many facets of reality. The term "humanities" has similar connotations. It suggests an approach to learning which is humane, which takes into account not only the object to be known, but the subject who knows and reacts to it.[1]

In view of this usage it is not strange that to many the liberal arts seem the very antithesis of the *sciences*. Science, as it is conceived today, connotes objectivity, precision, a rigid adherence to the "scientific method," a complete indifference to the "human equation." It seems an activity in which man is only cerebrally engaged and which requires the exclusion of all subjective overtones and of all interplay of individual taste or intuition. The scientific work must be something which can be repeated and retested by anyone trained in the technique. While the humanities are concerned with the inner nature and personality of things and of men, science is concerned only with data that can be measured.

To be sure, some scientists have hastened to tell us that their activity *is* creative, imaginative, free, and that it does express the personal passion and style of the discoverer. But it is hard

[1] For the contemporary view see David H. Stevens, *The Changing Humanities An appraisal of old values and new uses* (New York: Harper, 1953).

to recover this human element from the scientific work itself, from which it has been rigorously screened. Hence, it is thought by many, science can take on a liberal character only if it is treated from the viewpoint of the biography of the scientist and the record of his investigations, or in terms of the effect of his discoveries on human attitudes in the history of culture.

Hence it is not surprising that today even those who take their stand for the strengthening of liberal arts education frequently find it embarrassing to explain why, in the traditional list of the seven arts, the *quadrivium* consists of mathematical subjects which today are considered exact sciences, while from this list are omitted many of the studies which seem most truly humane and liberal, particularly history, philosophy, and the plastic arts.

Although this difficulty has been felt by many, it has seldom been faced squarely. St. John's College, Annapolis, and the General Program at the University of Notre Dame have courageously attempted to include the study of the classics of mathematics, astronomy, and music (the *quadrivium*) in their plans of liberal arts study. In somewhat different fashion the St. Xavier Plan of St. Xavier College, Chicago, has adopted the same policy of fidelity to the tradition.[2] But most schools emphasizing the liberal arts have preferred to group the mathematical subjects with the physical sciences, and touch upon them only as cultural influences in the context of the literary and historical "humanities." Indeed the present emphasis on more mathematics and science, fostered by the defense crisis, has appeared to many educators as the death of the liberal arts ideal.

One of the most carefully reasoned statements of this rather widely held position was given recently by a thinker who is actively engaged in promoting and developing the humanities in Catholic education, James V. Mullaney, in his article "The

[2] See *The St. John's Program, A Report* (Annapolis: St. John's College Press, 1955); *The General Program of Liberal Education* (Brochure) (Notre Dame: Notre Dame U., Indiana); and *The Liberal Education of the Christian Person* (Chicago: St. Xavier College, 1953).

Liberal Arts in the Aristotelian-Thomist Scheme of Knowledge." [3] It provides us a learned and direct confrontation of the current and the traditional views and will assist us in the following pages to judge the case on its own merits.

I: *What is the origin of the Thomistic theory of the liberal arts?*

Dr. Mullaney begins his discussion by reminding us that some scholars believe that the notion of the liberal arts is of Stoic origin. Consequently the question arises whether St. Thomas accepted this notion merely because he mistakenly supposed that it was a part of the Aristotelian heritage, and apologized for it as well as he could. A similar position has recently been taken by Robert Brumbaugh and Nathaniel M. Lawrence, Jr., with the difference that they believe the liberal arts to be of Platonic origin.[4]

Actually neither of these views is historically tenable. It is true, of course, that the first actual listing of the liberal arts as seven in number is found in the work of Martianus Capella (fifth century A. D.), who apparently derived his enumeration by omitting architecture and medicine from a list given by the Roman encyclopaedist Varro (first century B. C.), and that both of these writers were, in a vague way, Stoics.[5] However, both are highly eclectic writers, and the fact that they are important in canonizing this list, does not mean that they originated it, or that they drew it from Stoic sources.

Indeed, as regards the problem of the *quadrivium*, the Stoics

[3] The Thomist, XIX (1956), 481-505.

[4] "Aristotle's Philosophy of Education," *Educational Theory*, Jan., 1959. The authors remark (p. 51): "Ironically, his (Aristotle's) authority has been cited to justify notions he would certainly not have approved. The *trivium* and *quadrivium* which repeat the Platonic optimism in their stress on form, are an example." By this they mean that it is typical of Platonism to believe that some universal formal method is the key to truth, while it is typical of Aristotle to deny that there is any such simple clue, since there are many types of problems which require diverse and specialized methods of solution.

[5] See R. M. Martin O. P., "Arts Libéraux (Sept)," in *Dictionnaire d'histoire et géographie ecclésiastiques*, tom. 4, 827-843; and Friedrich Ritschl, "De M. Terentii Varronis disciplinarum libris commentariis," *Opuscula Philologica* (Leipzig: Teubner, 1877), III, 352-402.

never showed much interest in mathematics or the mathematical sciences, which played but a small role in their moralistic philosophy. The only Stoic writers who had mathematical interests, of whom Posidonius is the chief, are precisely those who had undergone strong Platonic or Peripatetic influences.[6]

Brumbaugh's suggestion is far more plausible, since the liberal arts are all referred to in one form or another in the Seventh Book of the *Republic* (see 522 A ff.), along with the notion that such arts form a *via* by which the student rises from opinion to true philosophy. Certainly the idea that mathematics, especially astronomy, is the path by which the mind passes to the realm of intelligible being and true science is one of the chief notes of Platonism.

Yet Plato cannot have been the originator of the liberal arts, for two fundamental reasons. First is the plain fact that these arts antedate Plato. Plato tells us himself that the *quadrivium*, exactly as we have it but without that title, was taught by the Sophist Hippias (*Protagoras* 318 E). Indeed, it is practically certain that these four mathematical arts go back to Pythagoras, or his school.[7] As to the *trivium*, the division of literary education into a more elementary study of letters (grammar) and a more advanced study of composition (rhetoric) was pre-Socratic.[8] In his lost dialogue, the *Sophistes*, Aristotle himself attributed the origin of dialectic to Zeno of Elea, and rhetoric to Empedocles.[9]

A second reason why we cannot admit that the seven liberal arts are purely Platonic is that this does not agree in detail with Plato's conceptions. It is well known that Plato strongly depreciates both grammar (as the study of the poets, *Republic* X) and rhetoric (*Gorgias*), and that for him dialectic (logic) is not a liberal art, but is philosophy itself.[10] Hence, at the

[6] Max Pohlenz, *Die Stoa, Geschichte einer geistigen Bewegung*, (Göttingen, 1948, 2 vols.), I, 50, 231; II, 105.

[7] See H. I. Marrou, *A History of Education in Antiquity* (New York: Sheed and Ward, 1956), pp. 46 ff. and 177 ff.

[8] *Ibid.*

[9] See Diogenes Laertius, VIII, 2, 57; Sextus Empiricus, *Adversus Math.*, I, 6-7.

[10] Of course Plato's criticisms of rhetoric and grammar are at the same time an

most, we can attribute to Plato some influence on the liberal arts tradition, but neither its origin nor its present form.

The real question is what Aristotle thought of these liberal arts which were the practice of the schools, and to which different interpretations and classifications might be given. Aristotle distinguishes liberal from servile studies on the grounds that the former are not utilitarian.[11] We know that among the liberal studies he included grammar (reading, writing), and the study of music, to which he says that drawing might be added.[12] Music, of course, is connected with poetry, which in turn, like rhetoric and dialectics, is rooted in logic in the strict sense.[13] Hence it safe to say that Aristotle considered the *trivium* as the basis of education, although for him the tripartite division is not significant.

The problem of the *quadrivium* is, indeed, more difficult, and here Dr. Mullaney may find some grounds for his view. Aristotle does not attribute the same kind of importance to mathematics as does Plato, since for him ascent to metaphysics is through physics, while mathematics is only a bypath.

Nevertheless, it is clear from *Ethics* VI (9, 1142a 19) that Aristotle believed that mathematics has a role in the education of the young and that it *precedes* the study of natural science. In our present list of liberal arts there are two features which are distinctly *not* Platonic, but Aristotelian: (1) logic is considered as distinct from philosophy; (2) mathematics as a liberal art is distinguished from natural science, which is one of the divisions of philosophy.[14]

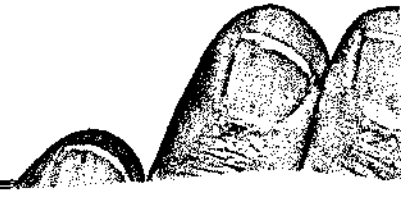
appeal for a new and more philosophical version of these arts. Nevertheless, in *Republic* VII, in the account of the ideal education, these arts are left in the shade, and the emphasis is wholly on the mathematical arts.

[11] *Politics* VIII, 2, 1337b 6 ff.

[12] *Ibid.*, 3, 1337b 24.

[13] See the first chapter of the *Rhetoric* and the *Poetics*, 19, 1456a 34.

[14] It is possible, however, that Xenocrates, Aristotle's fellow pupil, may also have played a role in distinguishing between dialectics as it is the higher philosophy for Plato, and logic as it is a liberal art, since Sextus Empiricus, *Adversus Log.*, I, 16, attributes the tripartite division of philosophy into rational philosophy (logic), physics (which included natural science and metaphysics), and ethics to him, and says it was adopted by the Academics, Peripatetics and Stoics.



The tradition as we actually have it probably originated in the schools of Athens and Alexandria under those mixed Platonic and Aristotelian influences which reigned throughout the Hellenistic period. The Epicureans rejected the whole notion, while the Stoics accepted it, but it does not appear that the Stoics added anything to it of importance unless we may attribute to them the conception of grammar as we now understand it. The earlier grammar was an unsystematic subject, and the Stoics did contribute to its more systematic study.[15] But even as regards grammar we must recall that the Stoics were only developing certain suggestions already present in Peripatetic thought, which had a vigorous growth independent of Stoicism among the literary critics of Alexandria.[16]

This historical survey, therefore, indicates that St. Thomas was not unhistorical in supposing that the liberal arts were compatible with the Aristotelian tradition. Rather his problem was to use the scattered remarks on the subject which are to be found in Aristotle's writings, and to give to the common and eclectic tradition of antiquity an interpretation which would be consistent with Aristotelian principles. We will see that this is exactly what he did, and that he showed rare historical as well as doctrinal tact in freeing this tradition from incompatible Stoic and Platonic influences.

St. Thomas quite unequivocally identifies the liberal arts with integral parts of the Aristotelian system. More specifically, he identifies the *trivium* of grammar, logic, and rhetoric, with *logic*, and the *quadrivium* of arithmetic, geometry, music, and astronomy with *mathematics* in the Aristotelian scheme of

[15] Pohlenz, *op. cit.*, I, 37-63; Marrou, *op. cit.*, p. 183, notes that in the Hellenistic period there was a strong tendency for the literary or humanistic studies to overshadow the *quadrivium*. "I ask those of my readers who are Greek and Latin scholars to decide: Is it not clear from the classics of this era that Hellenistic culture was predominantly literary in character and had little room for mathematics? It follows that mathematics played very little active part in the formation of the mind."

[16] See W. Jaeger, *Aristotle, Fundamentals of the History of His Development* (Oxford, 1948), pp. 328 ff., and J. E. Sandys, *A Short History of Classical Scholarship* (Cambridge, 1915), pp. 30-52.

a man's progressive learning. Thus, in answer to the objection that natural science and divine science should not be considered parts of speculative science since they are not enumerated among the seven liberal arts "into which philosophy is commonly divided," he states:

> . . . The seven liberal arts do not sufficiently divide theoretic [or speculative] philosophy, but as Hugh of St. Victor says in Book III of his *Didascalion* certain others having been passed over, seven are enumerated, since in these it was customary first to educate those who wished to learn philosophy. And therefore they are divided into the *trivium* and *quadrivium*, "since by these, as by certain paths [or *viae*], the lively mind enters in to the secrets of philosophy."
>
> And this also agrees with the words of the philosopher, who says in *Metaphysics* II that the method of science should be sought before the sciences. And the Commentator [Averroes] states in the same place that logic, which teaches the method of all the sciences, should be learned by one before all the sciences. To this pertains the *trivium*.
>
> He also says in *Ethics* VI that mathematics is able to be known by boys, but not physics, which requires experience. From which one is given to understand that first *logic*, then *mathematics* should be learned. To this (latter) pertains the *quadrivium*. And thus by these, as though by certain paths, the mind is prepared for the other physical disciplines.[17]

Having identified the *trivium* and *quadrivium* with *logic* and *mathematics* in the Aristotelian sequence, St. Thomas, in his exposition of the passage of *Ethics* VI which he alludes to above, proceeds to sketch out the full sequence of studies fit for a man:

> The fitting order of learning will therefore be as follows: *First*, boys should be instructed in logical matters, since logic teaches the method of the whole of philosophy. *Secondly*, however, they should be instructed in mathematics, which neither requires experience, nor transcends the imagination. *Thirdly*, they should be instructed

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[17] *In Boetii de Trinitate*, q. 5, a. 1, ad 3 (Decker). All translations of works of St. Thomas, including those from the *Summa Theologiae*, are by the authors, and are deliberately literal.

in natural things, which, even though they do not exceed sense and imagination, nevertheless require experience. *Fourthly*, in moral matters, which require experience and a mind free from the passions, as is stated in Book I. *Fifthly*, however, in sapiential and divine things, which transcend the imagination and require a strong intellect.[18]

Dr. Mullaney refers to this order as "the proper sequence of studies, according to Aristotle." Actually, however, it is not contained in so many words in the text of Aristotle, but is rather in the nature of a conclusion drawn by St. Thomas from Aristotle's consideration of the various disciplines in relation to the various stages in the development of the mind, in the *Ethics*.[19] That St. Thomas was quite committed to it may be seen from the fact that he already sets it down in one of his earliest works, *In Boetii de Trinitate*, in connection with the objection that, in the order of the speculative sciences, mathematics should be placed before physics, since it is natural for it to be learned before:

> . . . Mathematics presents itself to be learned before natural science, since boys can easily learn mathematics, but not natural science until more advanced, as is stated in *Ethics* VI.
>
> Whence among the ancients the following order is said to have been observed in learning the sciences: namely, that first, logic should be learned; then, mathematics; thirdly, natural science; afterwards moral science; and finally men should strive for divine science. Therefore mathematics should have been ordered before natural science.[20]

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[18] *In X Libros Ethicorum*, VI, l. 7, no. 1211 (Spiazzi).

[19] VI, 1142a 10-20. Curiously, St. Thomas found it quite hard to find a text in which Aristotle says that logic comes first! He makes use of the brief sentence in *Metaphysics* II (995a 14), "It is absurd to study a science and its method (πρότερος) at the same time." Yet anyone familiar with Aristotle's procedure will be convinced that he presupposes a good acquaintance with logic on the part of the student of any of the sciences which he treats. The only works where this knowledge of logic is not taken for granted are precisely in the logical works themselves (notably the *Poetics*, *Rhetoric*, *Topics*, and, if it is authentic, the *Categories*), where there is an avoidance of explicit use of technical logical terms, until they have been first defined.

[20] q. 5, a. 1, obj. 10. Some may be uneasy about accepting the *In Boetii de Trinitate* as expressing the true mind of St. Thomas in view of the fact that it is

While granting that the *universal* (or scientific) teachings of natural philosophy, which require for their collation experience and time, come to be learned after those of mathematics, which do not require extensive experience, St. Thomas in his response nevertheless states that natural things, as *sensible,* are naturally better known than mathematical things *abstracted* from sensible matter. Consequently, the more abstract knowledge of the *object* of mathematics comes into focus subsequent to the knowledge of the *object* of the philosophy of nature, even though the *science* of the former is then acquired prior to the latter.

The same order is deliberately set down again by St. Thomas in the *Prooemium* of one of his final works, the *Exposition of the Liber de Causis* (1269-73), by way of showing, from that order, how man's intellectual progress culminates in the best attainable knowledge of first causes:

. . . Wherefore they (the philosophers) set the science of first causes at the end, to the consideration of which science they were to depute the final time of their life.

a) Beginning, indeed, from logic, which transmits the method of the sciences;

b) Secondly, proceeding to mathematics, of which even boys are capable;

c) Thirdly, to natural philosophy, which, because of the need of experience, requires time;

d) Fourthly, to moral philosophy, of which a young man cannot by a suitable student;

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an early work, and that in commenting on Boethius, St. Thomas is quite obviously trying to reconcile the views of a number of authorities of very disparate philosophical character. A study of the texts collected in the present article, however, should set any such fears at rest, since the most crucial points are repeated in the *Summa Theologiae* and in such late works as the commentaries on the *Liber de Causis* and the *Metaphysics* and *Ethics*. Furthermore, it will be noted that the references occur in the *Prooemia* of these works where St. Thomas is not commenting on a text, but speaking *in propria persona,* or in passages where he is expanding the text with the purpose of incorporating his own special views. Someone might reasonably doubt that Aristotle had any such developed theory of the liberal arts, but this is all the more reason for taking this theory as that of St. Thomas himself.

e) Finally, however, they devoted themselves to divine science, which considers the first causes of beings.[21]

It should be noted, in connection with the consistency with which St. Thomas lays down what he calls "the fitting order of learning," consisting of logic, mathematics, natural science, moral science, and metaphysics, in that order, that this is not exclusively the ideal order of learning for philosophers, but the ideal order of learning for *any* man aiming at a *liberal* education, an education beginning with the liberal arts and having as its term the most liberal of all sciences, namely, divine science or metaphysics. Who should aim at a liberal education? *Every* man, as man, is oriented toward the goal of such an education, to be perfected in the life to come, and where the gifts of grace will more than compensate for any natural lack of attainment. Thus, in the *Prooemium* just mentioned, St. Thomas, previous to setting down the order of study leading to the study of the first causes, or divine science, shows that such a knowledge is indeed the end of man:

> It must be, therefore, that the ultimate happiness of man which can be had in this life, consists in the consideration of the first causes—since that least which can be known of them, is more lovable and noble than all those things which are able to be known of lower things, as is evident from the words of the Philosopher in *De Partibus Animalium* I (644b 32-34).
>
> Now accordingly as this knowledge is perfected in us after this life, a man is made perfectly happy, according to the words of the Gospel: *This is eternal life, that they should know thee, the true, living God.*[22]

For those who have not attained to such an acquired science

[21] *Super Librum de Causis Expositio, Prooem.*, no. 8 (Saffrey, 1954). This order already substantially appears in Moses Maimonides' *Guide of the Perplexed*: "Whoever wishes to acquire human perfection must first learn logic; then be gradually instructed in mathematics; afterwards, however, in physics; and after this in metaphysics." (See M. Friedländer's trans. London 1904, c. 34, no. 46).

[22] *Super Librum de Causis, Prooem.*, no. 5-6. The passage cited here by St. Thomas from *De Partibus Animalium* is also quoted in *Summa Theol.*, I, q. 1, a. 5, ad 1; I-II, q. 66, a. 5, ad 3; II-II, q. 180, a. 7, ad 3; *De Anima* I, l. 1, no. 5 (cf. note 94).

and wisdom in this life, the reward of charity will bring with it its equivalent and more in the next: ". . . Nothing prevents someone who is less good from having some [acquired] habit of science in the future life, which someone who is better does not have. But nevertheless this will be as of no consequence in comparison to the other prerogatives which the better will have."[23]

Thus, to the extent that one is educated, one will, according to St. Thomas, follow the sequence beginning with the liberal arts connoted in the first two steps of *logic* and *mathematics*, continuing on to the study of the nature of things in *natural science*, which culminates in the science of the first causes, *divine science* or *metaphysics*.[24] Between natural science and divine science there is found *moral science*. What is its role? It might seem that moral science, especially in its most eminent branch, political science, constitutes a terminus or a goal in itself, that of the perfection of the *active* life in comparison to the other goal which is the perfection of the *speculative* or contemplative life, attained in divine science. This is, however, neither according to the thought of Aristotle, nor to that of St. Thomas, for both of whom the natural course of human life is not *either* to the active or the speculative, but rather *from* the active *to* the speculative. Thus Aristotle states: ". . . We are busy that we may have leisure, and make war that we may live in peace. . . . If among virtuous actions political and military actions are distinguished by nobility and greatness, and these are unleisurely and aim at an end and are not desirable for their own sake, but the activity of reason, which is contemplative, seems both to be superior in serious worth and to aim at no end beyond itself . . . it follows that this will be the complete happiness of man. . . ."[25] St. Thomas does not differ from

[23] *Summa Theol.*, I, q. 89, a. 5, ad 2.

[24] The continuity between natural science and divine science may be seen in the division of the sciences given by St. Thomas at the beginning of his exposition of the *Ethics*, where he states: ". . . To natural philosophy it pertains to consider the order of things which the reason considers but does not make—in such a way that under natural philosophy we should also include metaphysics." (*1 Ethic.*, l. 1, no. 2).

[25] *Ethics*, X, 1177b 5-25. (Oxford translation)

this view. Thus, speaking of the relative merits of the intellectual virtues of wisdom, whose object is divine science, and of prudence, which reaches its highest state in political science, he quite definitely makes the latter the handmaid of the former:

> . . . It does not belong to prudence to interfere concerning the highest things, which wisdom considers. Rather it commands concerning the things which are ordered to wisdom, namely, as to how men are to arrive at wisdom. Whence in this is prudence, or political science, the servant of wisdom—for it introduces to it, preparing the way for it, as the doorkeeper does for the king.[26]

Because of this unequivocal subordination by Aristotle and St. Thomas of the active to the speculative, prudence to wisdom, moral science to divine science, it is clear that those curricula which, conversely, rank metaphysics as a kind of prelude to ethics, can in no way claim to be following the thought of the Angelic Doctor.

II. *St. Thomas is explicit concerning the liberal arts and their functions.*

Today, looking at the very broad way in which the term "liberal arts" is used—as applied, for example, to what may be designated as a "liberal arts curriculum"—one might imagine that the term is equally obscure in St. Thomas. Such is not the case. As has been seen above, St. Thomas relates the *logic* of Aristotle, considered as the indispensable learning of the method of the sciences before the sciences themselves, and the *mathematics* of Aristotle, considered as the science which one can most easily learn, to the *trivium* and the *quadrivium* respectively. In the same early work where he does this, namely, *In Boetii de Trinitate*, he continues, describing what each of the seven does:

> Another reason why these [the seven liberal arts, which are preparatory to speculative science, rather than its substance] are called, among the other sciences, 'arts' [rather than 'science'], is that they not only have knowledge, but a certain *product*, which is im-

[26] *Summa Theol.*, I-II, q. 66, a. 5, ad 1.

mediately of reason itself, such as to form a construction [grammar], syllogisms [logic], a discourse [rhetoric]; to number [arithmetic], measure [geometry], form melodies [music], compute the courses of the stars [astronomy].[27]

St. Thomas also underlines the distinctive "making" aspect of the liberal arts in the *Summa Theologiae*:

. . . Even in speculative things themselves there is something after the manner of a certain product, such as, for example, the construction of a syllogism [logic], or of a fitting discourse [rhetoric]; or the work of counting [arithmetic] or measuring [geometry]. And therefore whatever speculative habits are ordered to such works of reason, are called, because of a certain likeness, "arts," namely, the "liberal arts," in distinction to those arts which are ordered to works carried out by the body—which are in a certain sense "servile," in so far as the body is subject to the soul as a servant, and man according to his soul is free (*liber*).[28]

Since, therefore, the speculative reason makes certain things, such as, for example, a syllogism, a proposition, and other such, in which one proceeds according to certain and determinate ways, consequently, with respect to these the notion of "art" may be maintained. . . .[29]

Since it is evident that when St. Thomas speaks of the "liberal arts," he does indeed mean the logical *trivium* of grammar, logic and rhetoric, and the mathematical *quadrivium* of arithmetic, geometry, music and astronomy, it now remains to be seen how definitely he identifies the nature of these "liberal arts," which are apparently not quite the same as either the speculative sciences or the mechanical arts. To return to *In Boetii de Trinitate*, it is clear that St. Thomas does not intend to confer upon the "liberal arts" a status which is neither that of speculative science nor mechanical art, but rather to reduce them to one of the two, and this one is quite obviously the former, speculative science. Thus the "liberal arts" are not in the position of being arts which one somehow relates to the speculative sciences, but rather in the

[27] *In Boet. de Trin.*, q. 5, a. 1, ad 3.
[28] *Summa Theol.*, I-II, q. 57, a. 3, ad 3.
[29] *Summa Theol.*, II-II, q. 47, a. 2, ad 3.

position of disciplines organically related to speculative science, to which, for a special reason, the name "art" is attributed.

In effect, in the places already cited, St. Thomas unequivocally places the liberal arts in the domain of the speculative sciences. Thus, in the article of *In Boetii de Trinitate* in which he justifies the division of the speculative sciences into natural science, mathematics and divine science, one of the objections he answers is that *logic* or rational philosophy, placed by St. Augustine under speculative science, is not included in the threefold division of speculative science into (1) natural science or physics, (2) mathematics, and (3) divine science or metaphysics. St. Thomas answers by saying that speculative science is sought for its own sake, while logic, since it is sought for the sake of speculative science, lacks that characteristic. Yet if it is not a speculative science, nevertheless it ministers to speculative science:

> . . . The speculative sciences, as is evident in the beginning of the *Metaphysics*, are of those things whose knowledge is sought for its own sake. But the things about which logic is concerned, are not sought to be known for their own sakes, but as a certain help with regard to the other sciences. And therefore logic is not contained under speculative philosophy as though a principal part thereof, but as something reduced to it, in so far as it ministers to speculation its tools, namely, syllogisms and definitions and other such which we need in the speculative sciences. Whence, according to Boethius in the *Commentary on Porphyry*, it is not so much a science as the instrument for science.[30]

Likewise in the *Summa Theologiae*, logic and its accompanying liberal arts continue to be placed in the speculative domain:

> . . . Even in speculative things there is something after the manner of a product—for example, the construction of a syllogism or a fitting discourse. . . . And therefore whatever speculative habits are ordered to such products are called, because of a certain likeness, "arts," namely, the "liberal arts." . . .
>
> Since speculative reason makes certain things, e. g., a syllogism, a proposition and other such . . . therefore, there is found a certain speculative art. . . .[31]

[30] *In Boet. de Trin.*, q. 5, a. 1, ad 2.

[31] *Summa Theol.*, I-II, q. 57, a. 3, ad 3; II-II, q. 47, a. 2, ad 3.

Clearly, then, logic and the other liberal arts, while not attaining the name of "science"—since they are not *for their own sake*—nevertheless do find their place as preparatory to science in the speculative realm.

The above justifies *not* ranking the liberal arts as speculative "sciences," namely, because they are not for their own sake, but for the sake of those sciences. It remains to be seen why they *are* ranked as "arts." Here again, the reasons advanced by St. Thomas are quite unequivocal: they all have a "product" of some sort, which is the characteristic of the practical sciences in general, and the factive, servile or mechanical arts in particular. By virtue of this "product," the liberal arts, while not being "arts" in the strict sense of the word, nevertheless may be called so by extension. St. Thomas is careful, on every occasion, to state that they, the liberal arts, are only "arts" by extension—"according to a certain likeness." In order to be somewhat alike, yet not the same, the liberal arts, and the servile or mechanical arts, which incontestably merit the name of "art," must differ in something, which renders the latter "art" *per se*, and the former "art" only by attribution. This something is the fact that "art" in the strict sense has a product which goes out into external matter, while the "liberal art" does not have a material product but a product primarily in the mind, and one ordained to knowledge:

> Now art directs acts of making which go out into exterior matter, such as building and sawing—whence art is called "the right notion (*ratio*) of things able to be made." [32]
>
> . . . Reason acts with regard to certain things after the manner of a making, by an activity which goes out into exterior matter, which properly pertains to the arts called "mechanical." . . .[33]
>
> Now the order which the reason, upon consideration [of natural things], makes in exterior things constituted by human reason, pertains to the mechanical arts.[34]
>
> . . . [The seven liberal arts] have a certain product, which is immediately of reason itself. . . .[35]

[32] I *Metaphys.*, l. 1, no. 34.
[33] I *Polit., Prooem.*, no. 6 (Spiazzi).
[34] I *Ethic.*, l. 1, no. 2.
[35] *In Boet. de Trin.*, q. 5, a. 1, ad 3.

. . . Those arts alone are called "liberal," which are ordained to science; while those which are ordained to some utility to be attained by the action are called "mechanical" or "servile." [36]

From the above it is clear not only that the "liberal" arts and the "mechanical" arts are distinguished on the basis of their product, the one internal, the other external, but also that it is the latter which are "art" in the strict sense—since when St. Thomas defines "art" in the strict sense, he defines the mechanical arts. In effect, even though the liberal arts are speculative and as such, more noble than the mechanical arts, which are practical, this still does not entitle "art" to be ranked among the *speculative* intellectual virtues, along with "understanding, science, wisdom." Why not? The reason is simply that the liberal arts are not arts in the true sense: the true "arts," the mechanical arts, constitute the *practical* intellectual virtue of "art," while the liberal arts belong reductively to the speculative sciences.

. . . Whatever speculative habits are ordained to "products" of reason of this sort, are called, by virtue of a certain likeness, "arts," namely, the "liberal arts."

Now those sciences which are ordered to no work of this sort, are called "sciences" absolutely. Yet it does not follow that, if the "liberal arts" be more noble, they are thereby more deserving [than the "mechanical arts"] of the notion of "art." [37]

Having related the liberal arts to the speculative sciences, as St. Thomas so clearly does, one must clarify what it is, within the speculative realm, which distinguishes the liberal arts from the sciences. As seen immediately above, one of the characteristics of the speculatives sciences is to have no "work" of the sort which the liberal arts have. Consequently, by having such a "work," or "product," namely, a syllogism, a discourse, even a melody or a chart of the heavens, the liberal arts do not qualify fully as sciences. Why should a work or product in the speculative order cause them to occupy a lower rank? Needless to say, this is not because of any defect on their part, but

[36] I *Metaphys.*, l. 3, no. 59 (Cathala-Spiazzi).
[37] *Summa Theol.*, I-II, q. 57, a. 3, ad 3.

rather because it indicates a naturally subordinate position; they are not "for their own sake," but for the sake of the speculative sciences. ". . . The speculative sciences . . . are of those things whose knowledge is sought for its own sake. But the things about which logic is concerned, are not sought to be known for their own sake, but as a certain help with regard to the other sciences." [38] The liberal arts may be seen, therefore, as not being for their *own* sake, but being for the sake of *something*, namely, the *speculative sciences*, to the attainment of which their ministerial works and helps are ordained. Thus, as not being for their own sake, i. e., for the sake of their knowledge, they do *not* qualify as "sciences"; as having a product, they *do* qualify as "arts"; not however, as "arts" in the strict sense of the mechanical or servile arts which serve the body, but rather as "arts" reducible to "science," by virtue of the purpose of their products; and which, therefore, as serving that part of man which is free, namely, the soul, entitles them to be called the "liberal arts."

> Now the other sciences either do not have *any work*, but knowledge only—as in the case of divine and natural science—whence they cannot have the name of "art," since art is called factive reason, as is stated in *Ethics* VI, or else they have a *corporeal* work —as in the case of medicine, chemistry, and the like. Whence it is that these latter cannot be called *liberal* arts, since such activities are of man with regard to that part which is not free, namely, on the part of the body.[39]

III. *What of the ambiguous position of mathematics?*

While St. Thomas enumerates the *seven* liberal arts which constitute the *trivium* of grammar, logic and rhetoric, and the *quadrivium* of arithmetic, geometry, music and astronomy,[40] nevertheless it would certainly be doing violence to his thought to assume that he considered all seven indispensable to their function as aids to the speculative sciences. In effect, in the

[38] *Cf.* note 30 *supra.*
[39] *In Boet. de Trin.*, q. 5, a. 1, ad 3. Italics added.
[40] *Cf.* note 27 *supra.*

trivium, while grammar is necessary for *all* methodical communication, and logic for *all* reasoning according to art, and therefore for the speculative sciences, rhetoric, as concerned with the contingent as contingent, particularly in human affairs, is not ordained directly to speculative science.[41] In the same respect, while arithmetic, geometry and astronomy are necessary for the highest science, divine science, to which all the other speculative sciences are ordained, music is not.[42] Since the liberal arts, then, in their specific function as ministerial to the speculative sciences, do not absolutely require the presence of rhetoric or music, it is plain that when St. Thomas is speaking of the liberal arts, he is doing so generically, and not necessarily of all seven. It is quite in line with this generic outlook, then, that St. Thomas, when not describing the different "products" of each of the liberal arts in detail, equates the *trivium* to logic and the *quadrivium* to mathematics without further differentiation.[43] With regard to the essential part of the *quadrivium*, astronomy may be reduced to mathematics (or arithmetic and geometry) as being the organic and intended application of mathematics in line with the attainment of natural and divine science. Certainly, in the light of St. Thomas' own usage, his reduction of the *trivium* to logic could be taken quite literally,

[41] "The duty of rhetoric is to deal with such matters as we deliberate upon without arts or systems to guide us, in the hearing of persons who cannot take in at a glance a complicated argument, or follow a long chain of reasoning. The subjects of our deliberation are such as seem to present us with alternative possibilities: about things that could not have been, and cannot now or in the future be other than they are, nobody who takes them to be of this nature wastes his time in deliberation." (*Rhetoric*, I, 1357a).

[42] ". . . The order of this science (namely, divine science), is that it should be learned after the natural sciences, in which many things are determined which this science uses—such as generation, corruption, motion, and the like. It should be learned likewise after mathematics (i.e., arithmetic and geometry), for this science requires, in order to know the separated substances, the knowledge of the number and order of the heavenly spheres, which is not possible without astronomy—for which the whole of mathematics is a prerequisite. But other sciences are simply for its well-being, such as are music and the moral sciences and the like" (*In Boet. de Trin.*, q. 5, a. 1, ad 9). The idea that astronomy is needed for metaphysics seems very quaint today, but see below p. 513 ff.

[43] Cf. note 17 *supra*.

in that not only is rhetoric not necessary to speculative science, but even grammar would theoretically not be indispensable in the case of a man living a solitary existence, and discovering the sciences without oral communication or reading of books. On the other hand, logic, as the art of reasoning, would be indispensable, since, as Aristotle says in the beginning of the *Metaphysics*, "the animals other than man live by appearances and memories and have but little of connected experience; but the human race lives also by art and reasonings."[44] The need for art in man's life, and specifically the art of reasoning, is equally stressed by St. Thomas:

> As Aristotle says in the beginning of the *Metaphysics*, the human race lives by art and reasoning, in which the Philosopher is seen to touch upon a certain property of man wherein he differs from the rest of animals. For the other animals are led to their acts by a certain natural instinct; but man is directed in his acts by the judgment of reason.
>
> Whence it is that for the purpose of accomplishing human acts easily and in an orderly way there are different arts. For an art seems to be nothing else than a 'sure ordination of reason whereby, through determinate means, human acts attain to a due end.'
>
> But reason is not only able to direct the acts of the inferior parts, it is also directive of its own act. . . . If, therefore, because reason reasons concerning the act of the hand, the art of building or carpentering was discovered, by which a man is able to exercise such acts easily and in an orderly way, for the same reason there is needed an art which will direct the act of reason itself, by means of which a man may, in the act of reason itself, proceed in a way which is orderly, easy and without error.
>
> And this art is logic, i. e., rational science. And it is not only rational because it is according to reason—which is common to every art—but also because it is concerned with the very act of reason as its proper matter. And therefore it is seen to be the art of arts, since it directs us in the act of reason, whence all the arts proceed.[45]

Now, just as experience is related to particular reason, and custom to memory in animals, so is art related to universal reason. And therefore, just as the perfect routine of life for animals is

[44] I, 980b 25.

[45] I *Post. Anal.*, l. 1, no. 1-3 (Spiazzi).

through memory, conjoined with custom arising out of training, so the perfect rule for man is through reason perfected by art or in some other fashion. Certain ones, nevertheless, are ruled by reason without art—but this is an imperfect rule.

But what if someone were to object that such an icily intellectual concept of the liberal arts, whereby one might maintain that logic alone, considered as the art of going from the known to the unknown, without benefit of external word arrangement (grammar) or of the techniques of persuasion (rhetoric), would still have the essential requisites that St. Thomas prescribes for it as a prelude to the speculative sciences, seems hardly to connote a "liberal education" in the sense of the education of a free and cultivated gentleman-citizen? An answer to this would require a closer look at the meaning of the word "liberal" in the context of St. Thomas and Aristotle. It is certain that the word is associated with "liberty "and freedom," and connotes as its subject a man who is legally a "free" man and not a slave. And since the attainment of the speculative sciences supposes a certain freedom from practical cares, leisure and a sufficiency of worldly goods are likewise presupposed to a "liberal" life. However, the end of a liberal education is not the cultivation of leisure, but rather leisure is a means to an end, and that end is the attainment of truth in the speculative sciences, and ultimately in the highest of them, divine science. Thus the meaning of *liber* or "free" which is implied in the "liberal arts," while having the basic meaning of "that which is for its own sake," in contrast to *servus*, meaning "that which is not for its own sake, but for the sake of another," is not primarily fulfilled in the purely *legal* connotation of the word, as meaning a man who, whatever his state of soul, is legally free. Rather it means "free" in the more essential sense of a man who, while being legally free, and free from demanding material cares, uses this freedom to study the *sciences* that are free, the sciences that are "for their own sake," namely, the speculative sciences, and principally the freest of them all, divine science:

[16] I *Metaphys.*, l. 1, no. 16.

That man is properly called "free" (*liber*) who is not for the sake of another, but for his own sake. For slaves (*servi*) belong to their masters, and act because of their masters, and acquire for them whatever they acquire. But free men belong to themselves, as acquiring for themselves and acting in the same way. Now only this science is for its own sake: therefore this alone is free among the sciences.

And it should be noted that this may be taken in two ways. One way is that the phrase "this alone" should indicate generically *all* speculative science. In this case it is true that this genus of sciences alone is sought for its own sake. Whence, too, those arts alone are called "liberal' which are ordained to science—while those which are ordained to some utility to be had through action are called "mechanical" or "servile."

Another way is that the phrase in question should indicate specifically that philosophy, or wisdom, which is about the highest causes—since among the highest causes there is the final cause [which by definition is that "for the sake of which" something is done, while other things are done for the sake of it].[47]

It is clear, then, from the above, that the "liberal arts," taken in their strictest sense, mean for St. Thomas the arts ordained to the speculative sciences.

Would it then be foreign to the liberal arts to include among them such disciplines as rhetoric, which is of no use for the speculative sciences, and music (including the general matter of poetics), which, unlike astronomy which is indispensable, contribute only to the well-being of the highest speculative science? It is plain that St. Thomas does not intend to exclude them, since he enumerates them among the liberal arts without any special qualification. How can one consider their inclusion in a concept, which is clearly that of St. Thomas, of the liberal arts as ordained basically to speculative knowledge? Concerning rhetoric, the art of persuasion in matters over which we deliberate, one would say that it is the art which befits a citizen who is expected to take some part in the deliberations affecting his city or state. Such a man is the free man who, while aiming at the contemplation of speculative things, is nevertheless equipped, by virtue of his intellectual capacity, to play a role

[47] I *Metaphys.*, l. 3, no. 58-59.

in the ordering of the society he lives in for the good of all—it belonging to the intellect to order.

In effect, the characteristic of being a free man, as one of the prerequisites for acquiring the liberal arts as a prelude to the liberal sciences, is clearly derived, in the mind of Aristotle and St. Thomas, primarily from *nature*—legality can confirm this freedom, but it cannot of itself constitute it where it does not already exist. This is succinctly summed up in the statement of Aristotle: ". . . Some are slaves everywhere, others nowhere." [48] By this is implied that the status of a man as free or servile cannot be genuinely constituted by law or the fortunes of war: if a man is free by nature, even in captivity he remains a free man. What is this native freedom based upon? It is based, according to both Aristotle and St. Thomas, upon *intellect*. "For," says Aristotle," that which can foresee by the exercise of mind is by nature intended to be lord and master, and that which can with its body give effect to such foresight is a subject, and by nature a slave." [49] St. Thomas elaborates upon this statement as follows:

> . . . Nature not only intends generation, but also that what is generated be preserved.
>
> And that this, indeed, comes about in men through the association of ruler and subject, he [Aristotle] shows through the fact that he is naturally a ruler and master who by his intellect is able to foresee those things which befit preservation, e.g., by causing profitable things, and repulsing harmful ones. But he who is able through the strength of his body to fulfil in work what the wise man shall have foreseen by the mind, is naturally a subject and servant.
>
> From this it is quite clear that the same thing is in the interests of the preservation of both, namely, that the former should rule and the latter be subject. For he who is able because of wisdom to provide by his mind, meanwhile would not be able to be preserved for lack of bodily strength, unless he have a servant to carry out what he has foreseen; nor could he who abounds in bodily strength be preserved, unless he be regulated by the prudence of the other.[50]

[48] *Politics*, I, 1255a 30.

[49] *Ibid.*, 1252a 30.

[50] I *Polit.*, l. 1, no. 19. St. Thomas inquires in the *Summa Theologiae* (I, q. 96, a. 4) whether there would have been domination of one man over another even in

The universal outlook that in every unity of order there is an ordering principle and other elements that are ordered, is basic with Aristotle and St. Thomas:

> . . . In all things which form a composite whole and which are made up of parts, whether continuous or discrete, a distinction between the ruling and the subject element comes to light. Such a duality exists in living creatures, but not in them only; it originates in the constitution of the universe. . . .[51]

To whom does the ordering principle belong in a human community? It belongs to the wise man: ". . . For the wise man must not be ordered but must order, and he must not obey another, but the less wise must obey him." [52] St. Thomas not only approves these statements in the works where they first appear, but in his *Prooemium* to the *Exposition of the Metaphysics* he uses them to show first that among many sciences ordered to one end, namely, happiness, there must be one ordering, and then that this deserves to be called wisdom. Finally, in order to decide which science it is that has the characteristics of wisdom that makes it fit to rule, St. Thomas has recourse to Aristotle's statement that it is those men who excel in intellect who are the natural rulers, to conclude that it is the

the state of innocence. St. Thomas' answer is in the affirmative: there would be dominion, not of the sort which is over slaves, for the benefit of the master, but of the sort which is over freemen, for the benefit of the latter or of the common good. Why should this second kind occur at all? It occurs, says St. Thomas, because man is a social animal, living in a social unity, and in any unity made of many there is invariably a ruling factor and those who are ruled. Further, this redounds to the greater good of all, since if those better equipped by divine Providence in knowledge or in virtue rule, those less well equipped will benefit more than if obliged to shift for themselves. Clearly, then, St. Thomas, while stigmatizing slavery, or dominion for the benefit of another, as a consequence of original sin, does however envisage dominion for a subject's benefit or for the common good as a normal concomitant of man's social nature, so instituted by the Creator. It is this natural dominion which is envisaged by St. Thomas with Aristotle in the discussion of the composition of the domestic unity in the *Politics*, as the form of the discussion shows. Admittedly, however, those who hold, the facts notwithstanding, for an absolute, universal and unqualified equality among men, would term even any voluntary, non-slavish, subordination of one man to another for mutual benefit, "slavery."

[51] *Politics*, I, 1254a 25. Cf. *Summa Theol.*, I. q. 96, a. 4, c.; *In Metaphys., Prooem.*

[52] *Metaphysics*, I, 982a 15.

most *intellectual* science which will merit the name of wisdom and the role of ruler:

> As the Philosopher teaches in his *Politics*, when several things are ordered to one, one of them must be regulating or ruling, and the others regulated or ruled. . . . But all the sciences and arts are ordained to one thing, namely, to the perfection of man, which is his happiness. Whence it is necessary that one of them be the ruler of all the others, which one rightly claims the name of 'wisdom'—for it is the part of the wise man to order others.
>
> But what science this is, and with what it is concerned, may be considered if one will diligently inspect what makes one fit to rule. For just as men excelling in intellect, as the Philosopher states in the aforesaid book, are naturally the rulers and masters of others, while those men who are robust of body, but lacking in intellect, are naturally slaves, so that science should naturally be the regulator of the others which is intellectual above all. This science is the science which is concerned with the most intelligible things.[53]

Therefore it is plain that the man who by his intellect is able to tend through the speculative liberal arts to the speculative sciences, is more fundamentally free than the man who is only legally free. As free, he is a citizen in the state rather than a slave.

Furthermore, since the citizen in the perfect sense is one who takes an active part in the conduct of the city—a characteristic most true of citizens in a democracy—and since this active part implies a share in the rule, and the use of the intellectual virtue of prudence or practical wisdom, not only will the free man in the sense of the man of intellect be a citizen, but he will be one naturally fitted to share in the direction of the city.[54] It follows

[53] *In Metaphys., Prooem.*

[54] ". . . A citizen . . . in the strictest sense . . . (is one whose) special characteristic is that he shares in the administration of justice, and in offices. . . . Our definition is best adapted to the citizen of a democracy. . . . He who has the power to take part in the deliberative or judicial administration of any state is said by us to be a citizen of that state. . . . It has been well said that 'he who has never learned to obey cannot be a good commander.' The two are not the same, but the good citizen [in a democracy] ought to be capable of both; he should know how to govern like a freeman, and how to obey like a freeman—these are the virtues of a citizen. . . . Practical wisdom [i.e., prudence political or domestic] only is characteristic of the ruler: it would seem that all other virtues [i.e., temperance, fortitude, justice]

then that the man suited by nature for the speculative sciences, the man who by virtue of intellect is the genuinely free man, will also play a part in the life of the state. The bodies of such freemen, while not fitted for servile labor, are nevertheless "upright, and although useless for such (servile) services, useful for political life in the arts both of war and of peace." [55] St. Thomas explains this uprightness as follows: ". . . The bodies of freemen should be 'right,' i. e., well disposed according to nature, and useless for such servile activities (as digging and the like), as a delicate complexion requires; but nevertheless they should be useful for civil life, in which free men are active." [56] As students of St. Thomas know, since all knowledge comes through the senses, excellence of intellect requires a body conditioned thereto—not in the sense that the excellence of the intellect depends upon the body, but in the sense that nature, when intending a good intellect, shapes a body appropriate thereto. This St. Thomas underlines in the same place.[57] Consequently, then, since "man is more of a political animal than bees or any other gregarious animal," and a sign of this is that "man is the only animal which she (nature) has endowed with speech," which is "intended to set forth the expedient and inexpedient, . . . the just and unjust," [58] the free man will have the occasion to use speech in political assemblies, and therefore the study of rhetoric, which is not only useful in political science, but even occasionally masquerades as political science

must equally belong to ruler and subject" (*Politics*, III, 1275a 20; 1275b 5, 15; 1277b 10, 25).

[55] *Politics*, I, 1254b 25.

[56] I *Polit.*, l. 3, no. 70.

[57] ". . . Since the body is naturally for the sake of the soul, nature intends to form such a body as will befit the soul—and therefore it intends to give those who have the souls of freemen, the bodies of freemen, and likewise for slaves. And there is always this agreement so far as the internal dispositions are concerned, for it cannot be that anyone should have a well-disposed soul if the organs of the imagination and the other natural and sensitive powers were to be badly disposed. But in shape and external quantity and other external dispositions there can be found disagreement [i. e., a body *externally* not suited for the soul of a freeman]" (I *Polit.*, l. 3, no. 71).

[58] *Politics*, I, 1253a 5, 15.

itself,[59] will not be dissonant with a liberal education. This inclusion of *rhetoric* among the liberal arts, corresponds with the inclusion of *moral science*, whose chief part is *political* science, in the order of learning, after natural science and before divine science; ". . . What the rhetorician persuades, the political scientist judges. . . ." [60]

Would an outlook which includes *rhetoric* among the liberal arts because of the civic side of the free man's life, likewise find a place for *music* (and poetics in general), which, like rhetoric, do not have any direct bearing on the speculative sciences? St. Thomas states that music contributes to the well-being, the *melius esse*, of divine science, but is not, like astronomy, indispensable. In what way might it contribute? To answer this question it would seem normal to turn to the place where Aristotle treats *ex professo* of the role of music in liberal education in the *Politics*. The meager hints on the subject in the works of St. Thomas indicate sufficiently that he accepted this view of music.[61] In the *Politics* Aristotle not only includes music in a liberal education, even to the extent of advocating learning to play an instrument in youth in order to be a better judge later, but also assigns to it an explicit role in contributing to the highest goal of the liberal arts, the speculative sciences. It does this by affording a fitting relaxation from intellectual labor. What is said of music also applies to poetics or literary studies, which were generally considered by the Greeks as part of music, and which are grouped, as imitative arts, with music taken in the strict sense, by Aristotle.[62] Thus,

[59] ". . . Rhetoric masquerades as political science, and the professors of it as political experts. . . . (Rhetoric is useful because) we must be able to employ persuasion, just as strict reasoning can be employed, on opposite sides of a question, not in order that we may in practice employ it in both ways (for we must not make people believe what is wrong), but in order that we may see clearly what the facts are, and that, if another man argues unfairly, we on our part may be able to confute him" (*Rhetoric*, I, 1356a 25; 1355a 25).

[60] *Summa Theol.*, I-II, q. 7, a. 2, ad 3.

[61] See I *de Anima*, l. 7, nos. 95 and 97; *Summa Theol.*, II-II, q. 91 a. 2; *In Psalm.* 2, and 32; also the continuation of the commentary on the *Politics*, *loc. cit.*, and of *De Regimine* IV, c. 21 by members of the Thomistic school.

[62] *Poetics*, 1447b 15.

in addition to the useful or necessary arts, concerned with providing the things needed for sustaining life, there are those arts which accompany the pursuit of liberal things, things desirable for their own sake:

> . . . Our fathers admitted music into education, not on the ground either of its necessity or utility (for the needs of life), for it is not necessary, nor indeed useful in the same manner as reading and writing, which are useful in money-making, in the management of a household, in the acquisition of knowledge and in political life, nor like drawing, useful for a more correct judgment of the works of artists, nor again like gymnastic, which gives health and strength; for neither of these is to be gained from music. There remains, then, the use of music for *intellectual enjoyment in leisure;* which is in fact evidently the reason of its introduction, this being one of the ways in which it is thought that a freeman should pass his leisure. . . .[63]

It should be noted, of course, that the leisure here mentioned is not simply inactivity, but rather leisure from worldly business and preoccupations, allowing one to devote oneself to the active pursuit of the speculative truth. This relation of the active to the contemplative or speculative in human life, both of which aspects will concern the liberally-educated man, as noted when rhetoric was spoken of, is succinctly set forth by Aristotle in the same work:

> The whole of life is . . . divided into two parts, business and leisure, war and peace, and of actions some aim at what is necessary and useful, and some at what is honorable. . . . There must be war for the sake of peace, business for the sake of leisure, things useful and necessary for the sake of things honorable. All these points the statesman should keep in view when he frames his laws; he should consider the parts of the soul and their functions, and above all the better and the end. . . . For men must be able to engage in business and go to war, but leisure and peace are better; they must do what is necessary and indeed what is useful, but what is honorable is better. On such principles children and persons of every age which requires education should be trained.[64]

Music, and generically, poetics, while having their function

[63] *Politics*, VIII, 1338a 10. Italics added.

[64] *Politics*, VII, 1333a 30.

simply for the sake of pleasure, as a remedy for exertion generally, and also having their function in forming the passions in the moral sense, are in addition singled out by Aristotle as especially appropriate for relaxation in the leisure devoted to intellectual activity: ". . . Amusement is needed more amid serious occupations than at other times . . . for he who is hard at work has need of relaxation. . . ."[65] It is very reasonable, then, that the liberally-educated man, just as he should be, in acquiring the art of reasoning, equipped not only for speculative matters, but also, by learning rhetoric, for practical matters, likewise should be, in acquiring the mathematical arts, groomed not only in those directly related to speculative truth, such as arithmetic, geometry and astronomy, but also in those arts, namely, music and poetics in general, so admirably suited to provide necessary relaxation in that speculative activity.

Supposing then that one is prepared, in the concept of the liberal arts as introductory to the speculative sciences, which is certainly the role explicitly assigned to them by St. Thomas, to admit non-speculative rhetoric as an adjunct to the practical side of a liberal existence, and recreational music and poetics as an adjunct to speculative exertion, one is then ready to confront what is brought up by Dr. Mullaney as an objection against the whole *quadrivium*, or mathematics, as liberal *art*. In effect, since mathematics is listed by St. Thomas himself as the second of the three speculative *sciences*, which he distinguishes from the liberal arts, how can it at the same time be equated to the *quadrivium* which is part of the liberal *arts*? Needless to say, St. Thomas is not oblivious to this situation, which he presents in an objection in the *In de Trinitate* when he is speaking of the order of the speculative sciences. Thus St. Thomas lays down the following objection:

> . . . Mathematics presents itself to be learned before natural science, for the reason that boys can easily learn mathematics, but not natural science, until more advanced, as is stated in *Ethics* VI. Whence among the ancients the following order is said to have been observed in learning the sciences: namely, that first, logic

[65] *Politics*, VIII, 1337b 35.

should be learned; then, mathematics; thirdly, natural science; afterwards, moral science; and finally men would strive for divine science. Therefore mathematics should have been ordered before natural science.[66]

How does St. Thomas answer this objection? One might expect him to say that while the *liberal art* of mathematics is learned *before* natural science, the *science* of mathematics is learned *after* natural science. But he does not say it. His distinction is not between *science* and *art*, but between *science* and the *object* of science: the *object* of natural science is learned *before* that of mathematics; but the *science* itself of nature is learned *after* the science of mathematics.

> . . . Although natural philosophy presents itself to be learned after mathematics, for the reason that its universal teachings require experience and time, nevertheless, natural things, since they are sensible, are naturally more known than mathematical things abstracted from sensible matter.[67]

This answer makes no distinction between an art and science of mathematics, but simply states that although one knows the *object* of natural science first, nevertheless, because of the time required, one arrives at the knowledge of the *science* of nature, its "universal teachings," only *after* mathematics, which can be grasped without experience. Is mathematics, then, learned after logic and before natural science, a science *from the start?* This is indeed what Aristotle and St. Thomas say. In effect, in the passage referred to in *Ethics* VI, Aristotle speaks about "young men (who) become geometricians and mathematicians and wise in matters like these"[68]—and to say that one is 'wise' in a subject is to say that one has the perfection of it, has the science. That is how St. Thomas understands it, saying of the passage: ". . . They become wise in such, i. e., attaining to the perfection of these sciences."[69] When he alludes to this passage in the *In Boetii de Trinitate* in the process of assimilat-

[66] *In Boet. de Trin.*, q. 5, a. 1, obj. 10.
[67] *Ibid.*, ad 10.
[68] *Ethics*, VI, 1142a 10.
[69] VI *Ethics*., l. 7, no. 1208.

ing the *quadrivium* of arithmetic, geometry, music and astronomy to the *mathematics* of the *Ethics*, he refers to the knowing of the young in this respect as *scire*, "to know scientifically": ". . . He [Aristotle] states in *Ethics* VI that mathematics can be known scientifically (*possunt sciri*) by boys, but not physics, which requires experience." [70]

But if the *mathematics* which is listed as following *logic* in the *trivium-quadrivium* sequence of the liberal arts is really a science and not an art at all, why then does St. Thomas take the pains to classify it likewise as an art, describing, to justify that title, the various "makings" that are engaged in, such as numbering, measuring, forming melodies, computing the courses of the stars? The correct answer to this would seem to be that the *mathematics* of the *quadrivium*, *begins* as the last of the liberal arts and *ends* as the first of the speculative sciences. In other words, the student first learns mathematics as an art, and then when he now begins to learn things as sciences, the first science he comes to know is again mathematics. Such an explanation concords with St. Thomas' description of the subjects of the *quadrivium* as arts, and his simultaneous statement, together with that of Aristotle, that boys and young men can attain to the perfection of these *sciences*—but have still to attain to *physics*:

> . . . He (Aristotle) raises a question concerning this, namely, as to why a boy is able to become a mathematician, but is not able to become a metaphysician, or a physicist, i. e., a natural scientist.
>
> The Philosopher answers this by saying that these things, namely, mathematical things, are known by abstraction from the sensible things about which experience is—and therefore, for the knowledge of such there is not required a great length of time. But natural principles, which are not abstracted from sensible things, are considered by means of experience, for which there is required a long time.
>
> As to wisdom, however, he adds that young men do not believe, i. e., do not attain with the mind, sapiential things, i. e., metaphysical things, although they speak them orally; but as to mathematical things their essence is not inevident to them, since the

[70] *In Boet. de Trin.*, q. 5, a. 1, ad 8.

notions of mathematical things are of things imaginable, while sapiential things are purely intelligible. For youths can easily grasp those things which fall under the imagination.[11]

From this outlook, then, the meaning of St. Thomas, who lists the order of learning as logic, mathematics, natural science, moral science and metaphysics, without any special distinguishing of the first two from the latter three, is that one will first learn *logic* as an *art*, i. e., how to construct a sentence, form a syllogism, compose a speech; followed by the learning of *mathematics*, first as an *art*, involving measuring, constructing and the like, and then as a *science*, i. e., by beginning to see, especially through the application of logic, *why* things are as they are. Thus, through the constructions made in connection with the right triangle of the Pythagorean theorem, and which have the character of *art*, one is able clearly to show the role of those constructions as a middle term—as known from logic—linking together the square on the hypotenuse with the squares on the other two sides. In so doing, one shows or demonstrates *why* this must be so, i. e., one induces *science*.

In keeping with this transitional nature of mathematics, involving a beginning as art and a termination as science, one would not expect St. Thomas to cite it equally with logic when speaking of the liberal arts. And, in effect, whenever St. Thomas chooses to give an example of the liberal arts, or to use one type of them as a symbol of all, it is invariably *logic* which is named, as though it were "liberal art" par excellence. Thus, in the *Exposition of the Metaphysics*, when speaking of the arts which are "introductory to the other sciences," a designation he applies in the *In Boetii de Trinitate* to the liberal arts in general, he mentions specifically *logic* as though synonymous with all such arts:

> Since therefore several arts were found with regard to utility, some of which are for the necessities of life, such as are the mechanical arts, while others are as an introduction into the other sciences, such as the logical sciences, those artificers are to be called wiser whose sciences were not discovered for utility, but for the sake of knowing, such as are the speculative sciences.[12]

[11] VI *Ethic.*, l. 7, no. 1209-10.

[12] I *Metaphys.*, l. 1, no. 32.

. . . When they had nearly everything which was necessary for life, and those things which are "for leisure," i. e., for pleasure, which consists in a certain quietude of life, and those which are necessary for erudition, as are the logical sciences, which are not sought for their own sake, but as introductory to the other arts, then first did that prudence, i. e., wisdom, begin to be sought.[73]

That logic, while being learned as an *art*, i. e., not for its own sake—which characteristic of being not for its own sake, according to St. Thomas, distinguishes it as "art" rather than "science" (although he casually *calls* it "science" above nevertheless)—need not then be learned as a *science*, may be seen from the fact that its object, as a science, unlike that of the other sciences, is not real being, but being of the mind.[74] The *teacher* of logic should know it as a science, but the *student*, who is learning it not as an end in itself, need know it, so far as introductory value to the other sciences is concerned, initially at least, only as an art. Since the object of logic as such, namely, the second intentions of the mind such as genus, species, subject, predicate and the like, have a universality comparable to that of the *being* of metaphysics,[75] it would seem under this heading to be best studied later, on the level of metaphysics.

At this point, in connection with the relation of the "liberal *arts*" to the "speculative *sciences*," and in view of the fact

[73] *Ibid.*, l. 3, no. 57.

[74] ". . . The sciences are of those things which the intellect understands. But the sciences are of things, not of species or intelligible intentions, except for rational science [i. e., logic] alone" (III *de Anima*, l. 8, no. 718). ". . . The logician considers the mode of predication, and not the existence of a thing" (VII *Metaphys.*, l. 17, no. 1658).

[75] "'Being of reason' (*ens rationis*) is said properly of those intentions which reason finds in the things considered, such as the intention of 'genus,' 'species,' and the like—which, indeed, are not found in the nature of things, but are consequent upon the consideration of reason. And such, namely, the being of reason, is properly the subject of logic. But such intelligible intentions are equated to the beings of nature, in that all the beings of nature fall under the consideration of reason. And therefore the subject of logic extends to all the things of which the being of nature is predicated. Whence he [Aristotle] concludes that the subject of logic is equated to the subject of philosophy, which is the being of nature [or real being]" (IV *Metaphys.*, l. 4, no. 574).

that St. Thomas somewhat disconcertingly not only speaks of the former as *arts* introductory to the *sciences*, but also as *sciences* introductory to the *arts*,[16] it is perhaps appropriate to re-state the basic differences between "art" and "science." Clearly, in the present context, St. Thomas does not intend to separate the liberal arts absolutely from the speculative sciences, since he refers to them as "speculative habits," and does not distinguish them from "science" absolutely, but from "the *other* sciences" or "*those* sciences which have no such work." In effect, the distinction is made between the liberal arts and the speculative sciences, not on the basis that the former are arts which cannot be called sciences, but rather on the basis that the latter are sciences which cannot be called arts. The speculative sciences are those which because "they are ordained to no work . . . are called 'sciences' without qualification." They are not arts because these sciences which "do not have a work, but knowledge only . . . are not able to have the name of 'art.'"[17] On the other hand, it is not said of the liberal arts that they are *not* sciences, but rather that they *are* arts—in a manner of speaking. Consequently it is not surprising to see them referred to either as arts or sciences. At the same time it is extremely rare for the word "art" to be used of the sciences, and particularly of the speculative sciences, and when so used it is obviously intended to contrast, not with "science," but with "that which is not art," namely, the state of the reason before attaining to universal knowledge, as in the statement, "Now art arises when from many notions gained by experience one universal judgment about a class of objects is produced."[18] Returning to the liberal arts, it is plain that they do not differ from the

[16] For example, "whatever speculative habits are ordained to such works (of reason) are called by a certain similitude, 'arts,' namely, the 'liberal arts' . . . but those sciences which are ordained to no work of this sort, are called 'sciences' without qualification, but not 'arts'" (*Summa Theol.*, I-II, q. 57, a. 3, ad 3), while at the same time, "the logical *sciences* . . . are not sought for their own sake, but as introductory to the other *arts*" (I *Metaphys.*, l. 3, no. 57).

[17] Cf. *Summa Theol.*, I-II, q. 57, a. 3, ad 3; *In Boet. de Trin.*, q. 5, a. 1, ad 3.

[18] *Metaphysics*, I, 981a 5.

speculative sciences in the respect that the latter have knowledge and the former do not, but rather in the respect that while the liberal arts "not only have knowledge, but a certain work," the speculative sciences "have knowledge only."[79] This brings one to the fundamental distinction between art and science deriving from the distinction between the *practical* and the *speculative*, which are distinguished by their *end*. Both the latter indeed have knowledge, but in the case of the speculative, it is knowledge *for its own sake*, whereas in the case of the practical, the knowledge is *not* for itself but for the sake of something else, of some product.[80] This characteristic of being 'not for itself,' consequently, will be the basis for discerning the role of the liberal arts with respect to the speculative sciences, namely, that the former, while being ordained to the speculative, are *not* for their own sake, but for the sake of the speculative sciences, to which they minister. This does not mean, as we have already shown,[81] that the liberal arts are practical, strictly speaking. Only the servile arts (arts in the strict sense) are practical arts. The liberal arts are arts only in a loose sense, and hence are practical only in a loose sense, i. e., in comparison with the speculative sciences which have no artistic aspect. Thus, simply speaking, the liberal arts are speculative disciplines, but relatively, in comparison with natural science, metaphysics, and theology, they have an instrumental character and are valued not for their own sake but for the sake of the pure sciences.

Thus, with regard to *logic*, since it is not sought for its own sake, but as introductory to the other sciences, it will have the character of "art" even should one attain the very *science* of

[79] Cf. *In Boet. de Trin.*, q. 5, a. 1, ad 3.

[80] "Theoretic, i. e., speculative (knowledge) differs from practical according to end. For the end of the speculative is truth, as this is what it intends, namely, the knowledge of the truth. But the end of the practical is a work, for even though 'practical,' i. e., the operative, persons intend to know the truth, as to how it is found in certain things, nevertheless they do not seek it as the ultimate end. For they do not consider the cause of the truth according to itself and for the sake of itself, but while ordering it to the end of an operation, or applying it to some determined particular and some determined time" (II *Metaphys.*, l. 2, no. 290).

[81] See note 76 above.

logic, i.e., be able to show the manner of proceeding from principles to conclusions with necessary and demonstrative reasons.[82] Because logic is essentially not sought for itself and its very object, or subject-matter, *ens rationis* or being of the mind, is not the object of contemplation, it will therefore be taught as intended only when taught with the practical consideration of its use in the other sciences always uppermost. While the "reason why" is the end of the speculative sciences,[83] such knowledge is not indispensable to the concept of "art," since the knowledge is aimed at the work, and therefore, provided the principles are correct, one need not know the "reason why" in order to perfect the work: it suffices to know "that it is so" from experience of the art.[84] The perfection of the art, of course, implying the ability to meet cases not already provided for in what one has learned, involves knowing the causes.[85] In the meantime it is possible in logic for one to acquire certain general rules—such as the rules of the syllogism—which enable one to analyse reasoning and show *that* it is true or false by, for example, some comparison, even though one does not know as yet *why* such rules should be effective.[86]

[82] Thus dialectics as a science or as *docens* sets forth "the mode by which one may proceed through them [i.e., the intentions of reason] to showing conclusions in a probable manner in each of the sciences, and does this demonstratively—and in this respect is a science"; likewise sophistics "as it is *docens* transmits through necessary and demonstrative arguments the manner of apparent reasoning" (IV *Metaphys.*, l. 4, no. 576).

[83] ". . . The knowledge of the causes of some genus is the end to which the consideration of science attains" (*In Metaphys., Prooem*).

[84] ". . . The architects of things which are made, know the causes. But those . . . who perform the artificial operations . . . know 'that it is so,' but do not know the causes. . . . Those with experience ['that it is so'] are not able to teach, because they are not able to lead to science, since they do not know the cause" (I *Metaphys.*, l. 1, no. 28-29).

[85] "Now although someone may be able to act well without universal science, with regard to some particular, nevertheless, he who wishes to be an artisan should tend to universal knowledge. . . . For in all things it is necessary that one not only know the singular cases, but also that one have the science of that which is common—since perchance things will occur which are included under the common science, but not under the knowledge of individual happenings" (X *Ethic.*, l. 15, no. 2162-63).

[86] Thus, someone knowing the rules of the syllogism could analyse the following

But supposing that *logic* may be termed an "art," setting down as it does a "certain and sure ordination, whereby, through determinate means," one is able to construct a grammatical sentence, set down reasoning in the form of a syllogism, write a composition, the question remains about *mathematics* as an "art." Here, too, one starts by learning certain determinate means whereby one is able to meet the problems of multiplication and division, whereby one learns techniques of measuring surfaces and solids. It is here also that, as the *art* of mathematics begins to turn into the *science* of mathematics, one is first able to invoke the *method* of the sciences learned in logic, for the learning of the sciences themselves. Thus, knowing how it is a "middle term" which allows a "predicate" to be predicated of some "subject" to which it is not seen immediately to belong, one sees the "middle term" exemplified in the constructions of geometry which constitute the "missing link" in the proving of theorems—as in the case of the construction which is the middle term through which the squares on the sides of the right triangle are identified with the square

statement, "Harry Watkins must be very well off, since he belongs to the Athletic Club—to which everybody with money belongs," as an invalid syllogism in the second Figure. (*Major*: "Everbody with money belongs to the Athletic Club"; *Minor*: "Harry Watkins belongs to the Athletic Club"; *Conclusion*: "Therefore Harry Watkins is one of those with money.") Should one not be able to demonstrate by a deeper knowledge of logic *why* this must be so, one could set the fallacy in relief by showing its identity of form with some obviously false *example*, such as the encounter between Alice and the Pigeon:

"I—I'm a little girl," said Alice (whose neck had now stretched above the treetops) rather doubtfully, as she remembered the number of changes she had gone through that day.

"A likely story indeed!" said the Pigeon, in a tone of the deepest contempt. "I've seen a good many little girls in my time, but never *one* with such a neck as that! No, no! You're a serpent; and there's no use denying it. I suppose you'll be telling me next that you never tasted an egg!"

"I *have* tasted eggs, certainly," said Alice, who was a very truthful child; "but little girls eat eggs quite as much as serpents do, you know."

"I don't believe it," said the Pigeon; "but if they do, then they're a kind of serpent: that's all I can say."

This classic exchange from *Alice's Adventures in Wonderland* could be set down as a syllogism of the same invalid form as the example above: *Major*: "(All) serpents eat eggs"; *Minor*: "Alice eats eggs"; *Conclusion*: "Therefore Alice is a serpent."

on the hypotenuse in the Pythagorean theorem. By the application of logic to mathematics one is able to begin to grasp in practice the technique through which proof takes place, while still dealing with relatively simple and uncomplicated elements.

Even when mathematics passes, in the learner's mind, from the state of an "art" consisting mostly in techniques for getting things done, to the state of incipient "science," where one begins to see the necessary enchainment between things, and the relation of cause to effect, does it still bear the characteristic of an "art"?

As has been seen, the characteristic of "art" in the liberal arts arises from two facts: (1) they make a product interior to the mind; (2) they are not for their own sake, but are ordained by means of what they produce to aid the speculative sciences.

As regards the product of the mathematical arts, this consists in "counting and measuring," as we have already seen. But this counting and measuring need not be understood only in the sense of the performance of calculations as in elementary mathematics. St. Thomas tells us that it is peculiar to the mathematical sciences that although they demonstrate concerning real subjects, nevertheless, they define these subjects in an abstract mode by means of *constructive* definitions which manifest the essences of the subject through the work of the imagination guided by the intelligence.[87] This *mode of definition* is peculiar to mathematics and helps to account for its highly deductive character, its great unity as a system, and its special mode of verification by resolution to the imagination.[88] This

[87] "For geometricians discover the truth which they seek by dividing lines and surfaces. But division reduces that which was in potency to act. For the parts of a continuum are in potency in the whole previous to division. For if they were all already divided as the discovering of truth requires, the conclusions sought would already be manifest. But since in the first drawing of the figures these divisions are only in potency, the answer is not immediately manifest . . ." (IX *Metaphys.*, l. 10, 1888).

[88] ". . . It is evident that mathematical consideration is more easy and certain than either the natural or the theological [i. e., that of divine science or metaphysics], and much more so than that of the other sciences, the operative sciences—and therefore it above all is said to proceed *disciplinabiliter* [i. e., according to the mode

constructive character is not restricted merely to the elementary phase of mathematics but extends to its entire scope. Indeed it is more prominent in the most advanced branches of mathematics where the entities dealt with are known wholly through mathematical operations, which are constructions in St. Thomas' sense. It is just this constructive character of higher mathematics which has made plausible the erroneous views of Russell and the logicists who try to prove that mathematics is nothing but logic.[89]

As regards the ordering of mathematics to speculation, even though mathematics be itself one of the three speculative sciences, to the extent that it is for the sake of something else, it retains the character of art. And mathematics is *not* for its own sake in the rising motion of the sciences toward divine science: its ministerial character may be seen from the fact that its *speculative* aspects are not considered for themselves, but are ordained to the *concrete* and to *material* being in astronomy for the purpose of estimating the heavenly motions in the progress towards the first cause. Mathematics terminates, then, in this sequence, not as being known for itself, but as serving as a means towards the attainment of divine science or metaphysics. (One might say the same of natural science, which terminates at the threshold of spiritual substances with the rational soul,[90] but there is already a certain continuity

of scientific knowledge, from *discere*, 'to receive science from someone'] (*In Boet. de Trin.*, q. 5, a. 1, ad 2 q.).

"In mathematical things, therefore, it is necessary that definitive judgment (*cognitionem secundum judicium*) on a thing terminate in the imagination, not in the senses, for mathematical judgment transcends the apprehension of sense. Whence there sometimes is not the same judgment with respect to a mathematical line as with respect to a sensible line—as in the respect that a straight line touches a sphere only according to a point, which befits a separated straight line, but not a straight line in matter (*Ibid.*, a. 2, resp.).

[89] See Bertrand Russell, *Introduction to Mathematical Philosophy* (London, 1919). For the subsequent criticisms of this thesis see Max Black, *The Nature of Mathematics* (New York: Humanities Press, 1950).

[90] "The term of the consideration of natural science is concerning the forms which are in some sort separated, but nevertheless have their being in matter. And such forms are the rational souls. . . . But how the forms exist which are totally separated from matter, and what they are, or even how *this* form, i.e., the

between it and metaphysics or divine science, in that they both treat of real being, while the being of mathematics is abstracted —being able to be defined, though not to exist, apart from sensible matter—[91] and one arrives at the separated substances of metaphysics through the material substances of physics.[92] Consequently St. Thomas in his division of the sciences according to the orders reason considers, includes metaphysics under natural philosophy).[93]

Furthermore natural philosophy, since it treats of objects noble in themselves, namely, of the universe and of the human soul, has a certain nobility from its object, and hence deserves to be studied "for its own sake," although only secondarily in comparison with metaphysics.[94] But mathematics treats of

rational soul, exists accordingly as it is separable and able to exist without the body, and what it is according to its separable essence, these things it pertains to the first philosopher to determine" (II *Physic.*, l. 4, no. 375, Angeli-Protta).

[91] ". . . Of those things which depend upon sensible matter according to being, but not according to definition, is mathematics . . ." (II *Physic.*, l. 1, no. 3).

[92] ". . . The knowledge of these sensible substances is the way to the knowledge of the aforesaid separated substances" (VII *Metaphys.*, l. 17, no. 1648).

[93] "Now to natural philosophy it pertains to consider the order of things which human reason considers but does not make—including under natural philosophy also metaphysics" (I *Ethic.*, l. 1, no. 2).

[94] "Therefore all speculative science is good and honorable. But also in speculative science degrees of goodness and honor are found. For every science is praised because of its act, but every act is praised for one of two reasons: from its object and from its quality or mode. For example, to build a house is better than to make a bed, because the object of the act of building is better than a bed. But in the same [act] with regard to the same object, the quality [of the act] produces certain grades; since in so far as the mode of building is better, so is the building better. Thus, therefore if science or its act is considered with respect to its object, it is evident that that science is nobler which is more certain. Thus, therefore, one science is said to be more noble than another, either because it is of better and more honorable things, or because it is more certain. Now this is different in different sciences, since some are more certain than others, and nevertheless they are of things less honorable, but others are of things more honorable and good, and nevertheless they are less certain. The reason for this, as the Philosopher says in *De Animalibus XI*, is that we desire more to know a little of the highest and better things, even if we only know them dialectically and with probability, than to know much and with certitude of things less noble. For the former have nobility of themselves and have it substantially, but the latter from their mode and quality. But this science, namely of the soul, has both; because it is certain, for everyone experiences in himself that he has a soul and that he lives by the soul, and also because it is

an object which has nothing of nobility. Quantity is only an accident, and that accident which is most material in character, and mathematics does not even treat of it according to its real existence, but only in an abstract and imaginary fashion. Such nobility as mathematics has comes not from its object, but from its mode of great certainty and it is precisely this mode which characterizes it as a liberal art, since its certitude is based on the simplicity of its elements and its deductive character, and these are linked with its constructive mode of definition.[95]

In conclusion, then, when speaking of the relationship of

nobler, since the soul is the most noble among inferior creatures. . . . [Aristotle says] that the knowledge of the soul seems to be of much profit for all the truth which is treated in other sciences. For it gives notable opportunities to all parts of philosophy. Since if we consider first philosophy [metaphysics] we are not able to come to a knowledge of divine and highest causes, except through what we discover from the power of the possible intellect. For if the nature of the possible intellect were unknown to us, we would not be able to know the order of separated substances as the Commentator says on *Metaphysics XI*. But if we consider moral science, we cannot arrive at moral science perfectly, unless we know the powers of the soul. And thence it is that the Philosopher in the *Ethics* attributes each of the virtues to different powers of the soul. For natural science moreover it is useful, because a great part of natural things have souls, and the soul is the source and principle of all motion in animated things" (I *de Anima*, l. 1, no. 4-7). Cf. note 22. Of course for St. Thomas the treatise *De Anima* is a part of natural science, as is clear from this same *lectio*.

[95] "Now the process of mathematics is more certain than the process of divine science [i. e., metaphysics], since those things about which divine science is, are more remote from sensible things, from which latter our knowledge takes its rise—both with regard to the separated substances, to the knowledge of which we are insufficiently led by those things derived from the senses, and with regard to those things which are common to all beings, which are most universal, and thus most remote from the particulars which fall under the senses.

"But mathematical things fall under the senses, and are subject to the imagination, as in the case of *line, figure*, and *such*. And therefore the human intellect, deriving data from phantasms, more easily receives knowledge of them, and with greater certitude, than of any intelligence [i. e., separated substance], or even of the quiddity of substance, or of potency and act and *such*.

"And thus it is evident that mathematical consideration is more easy and certain than either the natural or the theological [i. e., that of divine science or metaphysics], and much more so than that of the other sciences, the operative sciences—and therefore it above all is said to proceed *disciplinabiliter* [i. e., according to the mode of scientific knowledge, from *discere*, 'to receive science from someone'] (*In Boet. de Trin.*, q. 5, a. 1, ad 2 q.).

logic and *mathematics*, the headings under which St. Thomas summarizes the *trivium* and the *quadrivium*, it appears safe to say that even should these two disciplines attain the status of sciences in the learner's mind, they would still be classified by St. Thomas under the category of "liberal arts"—since this category is attributed to them, not because they are *not* sciences, but because they *are* ordained to something other than themselves, which is the characteristic of "art."

At the same time it is important to note that the sequence of studies—logic, mathematics, natural science, moral science and metaphysics—laid down so clearly by St. Thomas, is in no way dependent upon one's historical outlook upon the origin, number, and function of the medieval "liberal arts." Had there been no *trivium* or *quadrivium*, St. Thomas' reasons for the sequence of studies would still be the same, since he derives it, not from the "liberal arts" of his day, but from his consideration of the order of studies in Aristotle—to which order he shows the conformity of the "liberal arts" system of his time. Thus he is unequivocal that one must begins one's acquisition of science with *logic*, which shows the method of science, as stated by Aristotle in *Metaphysics* II; then, since one cannot learn natural science immediately, because one has to wait for an accumulation of experience, one will begin the study of *mathematics*, indispensable for practical purposes, and likewise indispensable for a later ascent towards divine science, and which, since it does not require experience, one can begin to learn immediately. This latter decision is in line with Aristotle's investigation of the requisites for the acquisition of science in *Ethics* VI, and it is precisely there that St. Thomas chooses to spell out the order of learning in clearest detail, at Aristotle's words, "Indeed, one might ask this question too, why a boy may become a mathematician, but not a philosopher or a physicist."[28] The answer is, of course, that it is "because the objects of mathematics exist by *abstraction*, while the first principles of these other subjects come by *experience*." Since

[28] *Ethics*, VI, 1142a 15; St. Thomas, l. 7, no. 1208 ff.

the knowledge of metaphysics is derived from that of physics, the knowledge of separated substances from that of sensible substances, *natural science* will precede *divine science*. But what of *moral science?* Like natural science, it too requires experience.[97] But it requires something more than experience also, namely, control over the passions.[98] Thus moral science requires the time necessary for natural science and more besides. Why then is it not placed absolutely last, after metaphysics? The reason for this is simple: moral science, as perfected in prudence, both personal and communal, is ordained to divine science or wisdom, and not conversely.[99] Consequently, moral science will follow natural science and precede *metaphysics*: practical wisdom is subordinated to speculative wisdom.

The presence of *moral science* in the sequence of disciplines which are either ordered to, or actually are, *speculative science*

[97] ". . . A youth does not have knowledge of those things which pertain to moral science, which are above all known through experience. Now a youth is inexperienced in the activities of human life because of the shortness of time—and nevertheless the arguments of moral science proceed from those things which pertain to the acts of human life, and also are of those acts. For example, if it should be said that the liberal man keeps less for himself, and gives more to others, this the youth, because of inexperience, might perchance not judge to be true—and likewise in other civic things. Whence it is evident that a youth is not a fitting hearer of political science" (I *Ethic.*, l. 3, no. 38).

[98] "The end of this science is not knowledge alone. . . . Rather, the end of this science is human action, as it is of all the practical sciences. But those do not arrive at virtuous actions who follow their passions. And thus there is no difference with respect to this whether the hearer of this science be a youth in age, or a youth in behavior. For just as a youth in age fails from the end of this science which is knowledge, so he who is a youth in behavior fails from the end which is action . . ." (*Ibid.*, no. 40).

[99] "Since prudence is of human things, while wisdom is of the highest cause, 'it is impossible that prudence be a greater virtue than wisdom unless,' as it is stated, 'man were the greatest thing in the world' [referring to Aristotle's statement, '. . . It would be strange to think that the art of politics, or practical wisdom, is the best knowledge, since man is not the best thing in the world' (*Ethics.*, VI, 1141a 20)]. . . . Prudence commands concerning those things which are ordered to wisdom, namely, as to how men may arrive at wisdom, whence in this respect prudence, or political science, is the handmaid of wisdom: for it introduces to it, preparing the way for it, as the doorkeeper to the king" (*Summa Theol.*, I-II, q. 66, a. 5, ad 1).

raises the question of the nature of the education set down by St. Thomas in his "order of learning." Is it purely speculative, or is it a mixture of the speculative and the practical? This question already arose from the presence of the non-speculative *rhetoric* in the *trivium*. At that time it was noted that the free or liberal man of Aristotle and St. Thomas, since he was so basically by intellectual disposition, and since it was intellect and its accompanying power to order which made man naturally able to direct and provide, was naturally fitted to play a directive role in that unity of order for the common good which is society. The inclusion of *moral science* in the "order of learning" corresponds to the need for the liberally-educated man to be able to play his proper part in the striving for the common good: he must not only have the *practice* of virtue but he must also have the *science* of virtue, or moral science, in order to be able to recognize and foster civic or legislative steps towards virtue, in which the common good of the community lies.[100]

This of course implies that the *moral science* listed in the "order of learning" is not solely for the personal fostering of virtue in oneself, but also for the sake of giving one the "reason why" of virtue so that one may promote it intelligently in connection with the common good. In effect, the actual *practice* of virtue is already presupposed as being the result of habits inculcated from childhood. St. Thomas does not list moral science as intended to free the mind from the passions, but as already *presupposing* this freedom, attained by the actual practice of temperance, fortitude and justice.[101] Thus the moral

[100] ". . . He [Aristotle] shows towards what the city is ordained: for it was first made for the sake of living, in order that, namely, men might sufficiently find wherewith they might live—but from its existence there came about that men not only should live, but live well, in so far as through the laws of the city the life of man is ordained to the virtues" (*I Polit.*, l. 1, no. 31).

[101] "He [Aristotle] shows how the hearer of such things [i.e., of moral science] must be disposed. And he states that since in moral things we must begin from those things which are more known as to us, i.e., from certain effects which have been considered in connection with human actions, it is necessary that he who wishes to be an adequate hearer of moral science, be brought up and exercised in

virtues *precede* the intellectual virtues, so far as the practice of them is concerned.[102] What the liberally-educated man who is to play his role as a citizen, that is, as one who takes a part in the direction of the city, needs, is that intellectual virtue which is directive of the moral virtues, namely, prudence, not only personal, but domestic and civil, and this is what he is now intended to acquire in *moral science*.[103]

the customs of human life, i. e., concerning external goods and just things—that is, of the works of the virtues, and universally of all civic things. . . . For it is necessary to take as a principle in moral things *that it is thus*. Which indeed is received from experience and custom—for example, that concupiscences are overcome by abstinence" (I *Ethic.*, l. 4, no. 58).

[102] Aristotle, in the *Ethics*, first treats of the moral virtues, then the intellectual virtues, "and the reason for the order is that the moral virtues are more known [to us] and through them we are disposed for the intellectual" (II *Ethic.*, l. 1, no. 245).

[103] ". . . He [Aristotle] states that there is a certain rule according to which someone rules, not as a master over slaves, but as over free men, and his equals. And this is civil [democratic] rule, according to which now these, now others are raised to rule. . . . It is necessary that he who is a good citizen absolutely, know how to rule and how to be subject to rule. . . . The virtue of the ruler, properly speaking, is *prudence*, which is directive and governing. But the other moral virtues, whose notion consists in being governed and subjected, are common to subjects and rulers . . ." (III *Polit.*, l. 3, nos. 374, 376). ". . . If anyone should wish by his care to make men better, whether many or few, he should endeavor to arrive at the universal science of those things by which one is made good, i. e., to be a lawmaker, and know the art by which laws are made well—since through laws we are made good . . ." (X *Ethic.*, l. 15, no. 2163). ". . . Prudence and politics are the same habit according to substance, since both are the right reason of things which may be done with respect to human goods or evils; but they differ according to their reason for being. For prudence [in the restricted sense] is the right reason of things which may be done concerning the goods or evils of one man, i. e., of oneself. But politics is about the goods and evils of the whole civic multitude. . . . All [the different types of prudence in the extended sense, such as personal prudence, domestic prudence, political prudence] are species of *prudence* in so far as they do not consist in reason alone, but have something in the appetite. For to the extent that they are in reason alone, they are called certain practical *sciences*, namely, 'ethics,' 'economics,' and 'politics.' One should also consider that since the whole is more primary than the part, and consequently the city than the household, and the household than one man, it is necessary that political prudence be more primary than economic, and the latter than that which is directive of oneself. Whence lawgiving is more primary among the parts of politics and absolutely the most important in human affairs" (*Ibid.*, VI, l. 7, nos. 1196, 1200-01). That the liberally-educated man in his *moral science*—which is useless unless accompanied by will and action, making it *prudence*—should aim at that

From all of this one may see the position of the fivefold "order of learning" in the educational concept of St. Thomas. Starting from the very beginning of things, and following the order of nature, there is first the care of the *body*, in children, before the *soul*—although simultaneously in the supernatural order both body and soul must be reborn in baptism. Subsequently, as the soul awakes, the *moral* virtues, dealing with sense appetites, are fostered by training, awaiting the awakening of the *intellectual* virtues. With regard to the intellectual virtues, supposed as resting upon good moral practice, one begins first with training the mind itself to the art of thinking or *logic*, as a prelude to the mastery of all the other arts and sciences "ordered to one thing, namely, the perfection of man, which is his happiness." Of these, the first in order, *mathematics*, is unquestionably practical as well as speculative. The same may be said of *natural science* since, although it leads naturally to metaphysics, nevertheless all practical inventions are also derived from it. Among the intellectual virtues there is also that one which is specifically practical, namely, prudence, obtained by the combination of the knowledge of *moral science* with a right will and the remainder of the moral virtues, and which equips a man, now mature, to direct intelligently his own life and also that of the community. Finally, this sequence is kept in its true direction by the reservation of the ultimate position to *divine science* or metaphysics, the "philosophical theology," subordinated only to the "theology of Sacred Scripture,"[104] ordered to man's ultimate end, the knowledge of God.

This basic sequence of studies is plainly set down by St. Thomas as following the very nature of things for man. It tends to a speculative end, because such is the nature of man:

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most honorable aspect of it, political science, which is proper to *every* citizen in a democracy, since all are called upon to share in the rule, is evident from the fact that the young man being considered by Aristotle and St. Thomas with regard to moral *science* (following upon previous moral *practice*) is referred to as a "hearer of political science" (cf. note 97 *supra*).

[104] *Cf. In Boet. de Trin.*, q. 5, a. 4, c. fin.

As the Philosopher says in *Ethics* X, the final happiness of man consists in the best operation of man, which is of the supreme power, namely, the intellect, with respect to the best intelligible thing.[103]

Perhaps all cannot attain to such speculative knowledge, but everyone can begin, and reap benefits from logical training for reading, writing, thinking, and expression; then if one can learn anything, one can learn some practical mathematics; subsequently, if one cannot advance in natural science speculatively, one can always convert the movement from speculative *science* to practical *art* at any point along the road. Finally, for those who do not arrive at acquired prudence and wisdom, there are always infused prudence and wisdom which can more than compensate—but this does not excuse those who can develop the acquired habits also, from trying. At the same time, one cannot help but note that in this time of urgency when it is scientific method, natural science, mathematics, social science which are being recommended as most necessary and most timely, these are precisely what an education would have *that followed St. Thomas.*

IV *The doctrine of St. Thomas and the divergent views.*

We are now in a better position to compare this very rich and beautifully articulated theory of the liberal arts found in the works of St. Thomas, with current theories.

The chief preoccupation of current educators favorable to the liberal arts seems to be to introduce the "*humanities*," understood as *literature, philosophy,* and *art,* grouped around *history,* as the core of the liberal arts curriculum—specifically as replacing the *quadrivium* of tradition. To these some would add metaphysics and theology, provided that the latter be taught in a "humanistic fashion."[104] As Dr. Mullaney puts it, there is a widespread "feeling among administrators," that "mathematics and science [which he identifies with the traditional

[103] *In Librum de Causis, Prooem,* prin.

[104] See Gustave Weigel, S.J., "The Meaning of Sacred Doctrine in the College," in Gerard S. Sloyan, *Shaping the Christian Message* (New York: Macmillan, 1958).

quadrivium] are science and not art," along with the simultaneous feeling that the desired and needed liberal art subjects are "history and literature; or, if they are particularly enlightened, they will even say 'history, literature and philosophy'; or they may even be more accurate and say 'cultural studies,' or 'the humanities.'" This "feeling anticipated intellectual analysis, as it often does."[107] In effect, it appears that it is the practical need for the inclusion of more of the "humanities" or "cultural studies," in the face of a widespread educational indifference to liberal education, which is causing some Thomists to abandon the traditional theory of the liberal arts, in hopes of discovering a more persuasive approach.

The following lines will be devoted to, first, the cited author's objections against St. Thomas' doctrine; then, his realignment thereof; lastly, the position of the "humanities."

A. *Objections against St. Thomas' doctrine on the liberal arts.*

The current objections against the liberal arts, enumerated by St. Thomas in the *In Boetii de Trinitate* (q. 5, a. 1) as logic, comprising the *trivium* of grammar, logic and rhetoric;[108] and mathematics, comprising the *quadrivium* of arithmetic, geometry, music and astronomy, may be summed up succinctly in the proposition: These liberal arts, particularly the *quadrivium*, are *never* arts and *sometimes* sciences.

As Dr. Mullaney expresses it, they are not arts, because "art is productive knowledge, a making which passes into external matter, as in the useful or fine arts" (p. 241), and this is not true of any of the "liberal arts." Some of them, however, are

[107] J. V. Mullaney, *op. cit.*, pp. 503-4.

[108] These three are described by St. Thomas (cf. ad 8) as "forming a *construction, syllogisms* and *discourse*." The first, implying the process of grammatical construction, plainly corresponds to our idea of 'grammar'; the last, implying the art of composing a speech, writing a composition, quite easily corresponds to a contemporary 'composition and rhetoric' course; the second, centering on the syllogism, would correspond to a 'logic' course embracing at least formal logic. St. Thomas would certainly consider such a course as aiming ultimately at the whole *Organon* and thereby comprising demonstration, dialectics, rhetoric and poetics. Such a concept of logic, with grammar understood as a necessary prerequisite, would thus be identical with the whole *trivium*.

science. Thus, in the *quadrivium*, " two of the arts (arithmetic and geometry) are instances of (the science of) mathematics, and the remaining two (astronomy and music) are instances of physical science " (p. 25). Because of this, " there is simply no subject matter proper to the *quadrivium* " (*ibid.*). The same is true of grammar in the *trivium*: " As a liberal art it has no proper subject matter " and " usually has been interpreted to mean the study of literature . . . one of the fine arts " (*ibid.*). Later on, grammar " as the study of language, the art of second impositions " is given a " modest " status as a liberal art. " But so understood, grammar is not a liberal art suited to collegiate or university study [as ' liberal arts ' are here being considered]: it belongs where it used to be—in the grammar school " (p. 36).

Furthermore, not only are these " liberal arts " not *arts*, they are also not *liberal*. " Liberal knowledge is theoretical knowledge, knowledge sought for its own sake . . . but these logical and mathematical arts, called liberal, are sought for the sake, not of themselves, but of the theoretical knowledge to which they lead; hence the names *trivium* and *quadrivium*. They are propaedeutic, related as means to a further intellectual end " (p. 24). What is the conclusion of these objections, to the effect that the " liberal arts " are neither arts nor liberal, while some of them already are the subject-matter of sciences? " The upshot of the present consideration is that, so far as proper content or subject matter is concerned, there are at most two liberal arts, namely, rhetoric and logic. But the two problems urged above [i. e., of " arts " which do not regard the transformation of external matter; of something " liberal " which is not sought for its own sake] can be cited even against rhetoric and logic " (p. 26).

Obviously this criticism of St. Thomas' classification of the liberal arts reduces a handsome edifice to a pile of rubble. From this Dr. Mullaney and others hope to erect a new building planned on a very different principle.

But is the criticism valid? Is it true that the liberal arts in their traditional mode, are not liberal, not arts, and in most

cases are without any proper subject matter (since this subject matter already is the property of some science or fine art)?

First of all, what of the objection that they are not arts? St. Thomas agrees with this: they are not—but only have a certain likeness to art (*dicuntur per quamdam similitudinem artes*).[109] Why so? Because they have something after the manner of a product (*aliquid per modum cujusdam operis*).[110] Thus they are arts, if one wishes, only after a fashion. What of the objection that they are not liberal, not for their own sake? This likewise is true: St. Thomas agrees that they are propaedeutic, introductory to the other arts (*introductoriae ad alias artes*).[111] They are only *called* liberal, as ordered to the most liberal sciences, or to the liberal or speculative sciences in general.[112] Finally, what of the objection that certain of them have no proper subject-matter, since their subject-matter is already that of one of the *sciences*? St. Thomas would agree with this, also, namely, that some of the liberal *arts* may be *sciences* too. Thus he speaks of the logical sciences (*scientiae logicales*)[113] which are introductory to the other arts, meaning universal knowledge in general. With reference to mathematics, as related to the *quadrivium*, boys can become scientifically knowing in these matters (*mathematica potest sciri a pueris*),[114] can even attain to the perfection of mathematical science, mathe-

[109] *Summa Theol.*, I-II, q. 57, a. 3, ad 3; cf. note 28; 31; 37; 71.

[110] *Ibid.*

[111] I *Metaphys.*, l. 3, no. 57; cf. note 36; 47; 73; 76.

[112] ". . . Only this science (i.e., divine science or metaphysics) is for its own sake: therefore this alone is free (*libera*) among the sciences. . . . This may be taken in two ways. One way is that the phrase 'this alone' should indicate generically all speculative science. In this case it is true that this genus of sciences alone is sought for its own sake. Whence, too, those arts alone are called 'liberal' which are ordained to science. . . . Another way is that the phrase in question should indicate specifically that philosophy, or wisdom, which is about the highest causes (i.e., divine science or metaphysics) . . ." (I *Metaphys.*, l. 3, no. 58-9. Cf. note 47).

[113] I *Metaphys.*, l. 3, no. 57; cf. note 111; also note 82.

[114] *In Boet. de Trin.*, q. 5, a. 1, ad 3. The substance of St. Thomas' outlook on the liberal arts may be gleaned from this article of the *In Boetii de Trinitate*, and from *Summa Theol.*, I-II, q. 57, a. 3, ad 3, and II-II, q. 47, a. 2, ad 3.

matical wisdom (*fiunt sapientes in talibus, idest ad perfectionem istarum scientiarum pertingentes*).[115]

From the direction taken by Dr. Mullaney's article, it would seem that the most telling objection against the "liberal arts" concept as stated by St. Thomas is that some of the liberal *arts* are already *sciences*. Consequently, the sciences masquerading as pseudo-liberal arts—and which include, for Dr. Mullaney, the whole *quadrivium*—having been eliminated from the sequence, a whole space is left empty, and the vacated area may now be filled by the neo-liberal arts, the "humanities." On the other hand, supposing that it make no difference if the "liberal arts" be considered, or actually be, sciences, then the whole argument becomes inexistent. From the words of St. Thomas there is clearly no objection to the liberal arts being sciences. On the contrary, it is an ideal state which, if not indispensable, is at least desirable—for example, that a user of logic actually have the science of the various branches of logic he uses, that a user of mathematics actually have demonstrative knowledge of the formulas in geometry he employs.

But if they can be sciences, why then call them "liberal arts"? St. Thomas answers this by saying that the "arts" in question are called "arts" as well as sciences (*inter ceteras scientias, artes dicuntur*) because they not only have knowledge, but also a product (*quia non solum habent cognitionem, sed opus aliquod*).[116] Having been called "arts," they must then be called "liberal" to distinguish them from the servile or mechanical arts, which have a corporeal work (*habent opus corporale . . . unde non possunt dici artes liberales*).[117] Furthermore, they are ordained to the "liberal" or speculative sciences, as seen above.[118] But how can subjects such as grammar, rhetoric, music, even admitting it to be possible for them to be the subject of science, be ordered to the *speculative* sciences? The answer is that they cannot be directly, but rather they play

[115] VI *Ethic.*, l. 7, no. 1208; cf. note 18; 68; 71; 96.
[116] *In Boet. de Trin.*, q. 5, a. 1, ad 8.
[117] *Ibid.*
[118] Cf. *supra*, note 112.

a role in the existence of the fully-rounded liberal man. Such a man does indeed set his goal on that wherein consists the ultimate end of man, namely, the knowledge of divine things, as pursued in this life by the speculative sciences ordained to the most speculative and liberal of them all, divine science, both natural and supernatural. However, as St. Augustine puts it, and St. Thomas cites it, the speculative *love of truth* (*charitas veritatis*) must recognize also the practical *necessity of charity* (*necessitas charitatis*).[119] Consequently, the truly liberal man will have a contemplative life which does not necessarily exclude the active. Apart from the motivation of working for the common good, the active life can also in a personal sense be conducive to the speculative life by maintaining the moral virtues.[120] Therefore the education of the liberally-educated man will equip him for the market-place and the forum. For this, and in keeping with the directive role that accompanies a trained intellect, he should first of all be literate, i.e., know grammar. Thus, St. Thomas, elaborating on Aristotle's concept of natural subjection, links to some extent the latter with illiteracy, and the leadership of reason with literacy:

> Now to some those seem to be called "barbarians" who do not have written speech in their vulgar tongue. Whence Bede is said to have translated the liberal arts into the English tongue lest the English be thought barbarians.
>
> . . . It is plain that from the power of reason there proceeds that men should be ruled by reasonable law, and that they be trained in letters. Whence barbarism is fittingly manifested by the sign that men either do not have laws, or have irrational ones—and likewise that among some people there does not exist the exercise of letters.[121]

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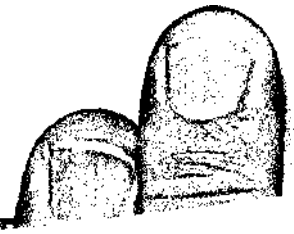
[119] Otium sanctum quaerit charitas veritatis; negotium justum suscipit necessitas charitatis (*De Civitate Dei*, IX, c. 19). Cited by St. Thomas in *Summa Theol.*, I-II, q. 61, a. 5, ad 3; II-II, q. 182, a. 2, c.

[120] ". . . The active life, in so far as it composes and orders the interior passions of the soul . . . aids contemplation, which is impeded through the disorder of the interior passions" (*Summa Theol.*, II-II, q. 182, a. 3, c.).

[121] I *Polit.*, l. 1, no. 22-3. If Venerable Bede instituted the liberal arts to offset illiteracy, then writing, and consequently grammar, must be part of them. One notices also that this is connected with the active or civic status.



For the same reason, the liberally-educated man will be taught rhetoric, enabling him to put his ideas across persuasively in the open forum. Its connection with politics, the principal part of moral science, may be seen from the fact that in the Middle Ages a rudimentary law course was given as part of rhetoric.[122] This art, once acquired, should serve as an auxiliary to that single intellectual virtue called "science" yet specifically ordained to practical action, namely, *moral* science, in its most important aspect, political science.[123]

In this same vein, music and poetics too may be considered as part of a liberal arts education in the context of St. Thomas without for that reason having to be either a science or ordained directly as an instrument of speculative science. Speculative effort requires relaxation even more than physical effort.[124] This may be supplied by music and poetics as "intellectual enjoyment in leisure."[125] But in order to do this intelligently, one should make some study of the matter. Hence some study of the art of music, and of literary works, is well consonant with a complete liberal education.

But while it may seem sensible enough to call those aspects of a liberal education "arts" which are clearly not learned as sciences for their own sake, but as aids to the liberal life, such as the art of writing a sentence clearly and correctly, the art

[122] "At least some rudiments of law were everywhere taught in the 'schools of the Liberal Arts' and by the masters of these arts. The old division of rhetoric into the three branches, 'demonstrative,' 'deliberative,' and 'judicial,' allowed the introduction of law-studies under the last-mentioned category without requiring the addition of a new art to the sacred Seven" (H. Rashdall, *The Universities of Europe in the Middle Ages*, ed. F. M. Powicke and A. B. Emden, 2 ed., 3 vols., Oxford: Oxford University Press, 1936, I, 102). Cf. note 60. St. Thomas so divided rhetoric in X *Ethic.*, l. 16, no. 2173.

[123] ". . . By prudence commonly so called a man rules himself in order to his own good, while through political (prudence) . . . to the common good" (*Summa Theol.*, II-II, q. 50, a. 2, ad 3).

[124] ". . . When the soul is raised above sensible things, intent upon the works of reason, there arises thence a certain fatigue of the spirit, whether a man be intent upon the works of practical reason or of speculative—nevertheless more so if he be intent upon the works of contemplation . . ." (*Summa Theol.*, II-II, q. 168, a. 2, c.).

[125] *Politics*, VIII, 1338a 20.

of speaking and writing persuasively, the art of selecting music and literary works and, in general, suitable relaxation, in a way as concordant as possible with intellectual effort, what of those disciplines which fall specifically under the head of speculative science, namely, the various branches of *mathematics?* How can mathematics, and specifically, arithmetic, geometry and astronomy—supposing music to be cultivated more for relaxation than for science—be called liberal *arts?* They certainly contain knowledge for their own sake, as when one learns the properties of geometrical figures as part of the *truth* of things without any reference to any *practical* application. But here one may notice that just as logic may be called a liberal "art" with reference to the science of mathematics, since it, for example, teaches how to construct demonstrations which geometry uses, so too the speculative science of mathematics may be considered an "art" with reference to the most speculative of all the sciences and to which the others are all ordained, namely, divine science: "All the others are ordained to it as to the end—whence this science alone is preeminently for its own sake." [126] The ordination of mathematics to divine science is mentioned by St. Thomas as being through astronomy,[127] which science is, with respect to the arithmetic and geometry from which it is derived, an application to the concrete.[128] Consequently, if astronomy is for the sake of the ultimate science and not for its own sake, and therefore an "art" in that it supplies something which divine science uses, so also the principles of arithmetic and geometry, which are not ends in themselves, find, so to speak, their perfection in

[126] I *Metaphys.*, l. 3, no. 59.

[127] ". . . This science (i.e., divine science) needs to know, for the knowledge of the separated substances, the number and order of the heavenly spheres, which is not possible without astronomy, for which the whole of mathematics is prerequisite" (*In Boet. de Trin.*, q. 5, a. 1, ad 9).

[128] ". . . The *scientiae mediae* . . . take principles abstracted from the purely mathematical sciences, and *apply them to* sensible matter, as, for example . . . astronomy applies the consideration of geometry and arithmetic to the heavens and its parts. . . . Since the consideration of these sciences terminates in natural matter, although they proceed through mathematical principles, they are more natural than mathematical" (II *Physic.*, l. 3, no. 164).

making possible the astronomy which divine science uses: just as astronomy is an "art" with respect to divine science, they are an "art" with respect to astronomy.

The idea that mathematics, and above all astronomy, is required for metaphysics certainly appears today as a strange notion. Of course St. Thomas has in the mind the arguments by which Aristotle in *Metaphysics* XII (1073a 15) attempted to determine the number of the separated intelligences by means of dialectical arguments drawn from the mathematical hypotheses of the astronomers as to the number of distinct planetary motions.

Nevertheless, the notion will not seem so implausible if we stop to consider that all that philosophy can know about the Creator must be drawn by inference from a study of his creation. Thomist metaphysicians today tend to ignore any but apodictic arguments in metaphysics, and to reject probable argumentation as beneath the notice of their science. Thus many Thomists were made acutely uncomfortable by the well-known address of Pius XII to the Pontifical Academy of Sciences in which he made use of modern physical theory to confirm and "illustrate" the traditional Thomistic proofs of the existence of God.[129] St. Thomas, however, did not scorn dialectical reasoning in metaphysics. He constantly quotes the famous saying of Aristotle that "even a little probable knowledge of divine things is worth much more than certain knowledge of less noble objects."[130]

Hence, metaphysics does not scorn such light as can be cast on the nature of the divine by a study of the physical cosmos, even if that knowledge be only probable. This knowledge is had through natural science, but natural science is not able to go very far in showing us the general plan of the universe without the assistance of the conjectures of mathematical physics. Hence the theories which modern physicists call "cosmology" and which are chiefly astronomical and mathematical in char-

[129] *AAS.*, 44 (1952), pp. 31-43.
[130] I *de Anima*, l. 1, no. 7; cf. note 94, 92 and 22.

acter would have been treated by St. Thomas with genuine respect, and Pius XII was truly of the same spirit.

This does not mean, by the way, that the only contribution of mathematics to metaphysics is by way of astronomy. The fact that mathematics provides us with our clearest ideas of unity, multitude, order, relation, and beauty [131] means that it is of immense importance to the metaphysician in forming the analogous and transcendental concepts which he uses. Indeed the very conception of *analogy* so fundamental to the method of metaphysics is derived (by analogy) from the mathematical notion of *ratio* and *proportion*.[132] Plato and St. Augustine were not mistaken in thinking that mathematics plays a very great role in the development of the mind as it passes from the sensible to the intelligible order, and Aristotle does not reject this conception, as long as it is understood that the role of mathematics is confined to an analysis of the order of formal causality, and cannot substitute for natural science in the study of the other causes.

One might then say: Why not call natural science an "art" too, since it also is not wholly for its own sake but is ordained to divine science? One could indeed do this, but historically natural science entered the curriculum *after* the "seven" liberal arts had become more or less sacrosanct. At the same time, natural science already has a certain community with divine science, since both are of the being of nature and one leads naturally to the other: ". . . The knowledge of these

[131] "Now since the good and beautiful are different (for the former always implies conduct as its subject, while the beautiful is found also in motionless things), those who assert that the mathematical sciences say nothing of the beautiful or the good are in error. For these sciences say and prove a great deal about them; if they do not expressly mention them, but prove attributes which are their results or their definitions, it is not true to say that they tell us nothing about them. The chief forms of beauty are order and symmetry and definiteness, which the mathematical sciences demonstate in a special degree. And since these (e.g. order and definiteness) are obviously causes of many things, evidently these sciences must treat this sort of causative principle also (i.e. the beautiful) as in some sense a cause." (*Metaphysics*, XIII, c. 3, 1078a 32-55).

[132] Cf. J. Ramirez, "De analogia sec. doctrinam aristotelico-thomisticam." *La Ciencia Tomista*, XIII (1921), 20-40; 195-214; 337-357.

sensible substances is the way to the knowledge of the aforesaid separated substances." [133] Thus the existence of the divine substance, which is the end of all knowledge, is already attained in the *Physics*, where one arrives at the First Mover—as St. Thomas states in his *Exposition of the Metaphysics*.[134] In effect, St. Thomas does not look on metaphysics as proving the existence of the divine being, but as understanding something of it, its existence having already been established in natural science.

To sum up the cogency and importance of objections leveled at the seven liberal arts—which St. Thomas does indeed accept and enumerate in harmony with his contemporaries—as being not "liberal," not "arts," but, if anything "sciences," with reference to a liberal education in St. Thomas' terms, one need only suppose for a moment that there is no such thing, and and never was any such thing, as the seven liberal arts, and then ask onself what consequences that would involve for St. Thomas' outlook. The answer is: None. In effect, St. Thomas says that the education leading to man's natural end, the knowledge of the first cause, begins naturally with *logic*, which teaches the method of all the sciences, the art thereof—and man is intended to live by art. This done, one would proceed to the first of the sciences to be learned, namely, *mathematics*. What is involved in these two steps? It is clear that "logic" means for St. Thomas, ideally speaking, the whole of the *Organon*, as he himself sets forth in the prologue to his *Exposition of the Posterior Analytics*, involving thus the study of all of formal logic in *Categories*, *Peri Hermeneias*, *Prior Analytics*; demonstration in *Posterior Analytics*; dialectics in the *Topics*; rhetoric in the *Rhetoric*; drama and literature and allied subjects in the *Poetics*; sophistics in the *De Sophisticis Elenchis*. What of "mathematics"? As to the content of this as a stage on the way to divine science, St. Thomas

[133] VII *Metaphys.*, l. 17, no. 1648. Cf. note 92.

[134] ". . . It was proved in *Physics* VIII that, since one may not go to infinity in movers and things moved, it is necessary to arrive at some First Immovable Mover . . ." (XII *Metaphys.*, l. 6, no. 2517).

has already been cited as stating that it involves astronomy, for which all of arithmetic and geometry are prerequisite. Likewise, in this pursuit St. Thomas recognizes the need for relaxation and certainly music and allied arts would be approved by him. Consequently, even if there were no "liberal arts," anyone who endeavored to follow the educational pattern traced by St. Thomas would still find himself following a course which is substantially that of the traditional seven. So, let us concede that the liberal arts are not liberal arts—St. Thomas' teaching and its motivation still remain the same.

B. *St. Thomas' division of the arts and sciences as against the realignment thereof.*

The following steps are intended to express the genesis and development of the arts and sciences, under the general heading of the intellectual virtues, as St. Thomas himself expresses them. The number of the steps will also be found in the accompanying outline, indicating the sequence to be followed. Subsequently there will be listed under each of them the pertinent references in St. Thomas. Following this certain differences will be noted between this outline and current conceptions.

Steps in the genesis and development of the arts and sciences:

(1) The basic division of the *arts* and *sciences*, representing that by which man lives as a man, and contained under the general heading of the *intellectual virtues*, sees these divided into *speculative* and *practical*, accordingly as the knowledge in question is desired for the sake of knowing the *truth* of things, or is further ordered to *doing* or *making* something.

(2) First among these habits of mind which are the intellectual virtues is *understanding*, the habit of *first principles*, which all subsequent thought, whether in the speculative or in the practical order, presupposes.

(3) Since one must live before one can speculate, man's first concern is directed towards the necessities of life, and the arts first invented, those arts comprising certain sure principles

derived from experience and ordained to the making of things, are called, generically, the *practical* intellectual virtue of *art*. These arts, by contrast with the subsequent " liberal " arts, are called " servile," and also " mechanical," " manual." In contrast to the practical habit of *doing*, which causes the knowledge of *prudence* to be called " *active*," that of the *arts* is called " *factive*."

(4) Once man has mastered the arts of acquiring the necessities of life, he turns naturally to those arts concerned with *pleasure* and *relaxation*. Such arts would be, for example, music, the dance, theatre, poetry and other literature, and would fit under the contemporary category of the " *fine* " arts. Such arts, while originating initially as relaxation from *physical* labor, may also, as man becomes more engaged in *intellectual* labor, become correspondingly more intellectual and even serve to communicate the truth, especially moral truth, through representation.

(5) The necessities of life and due relaxation having been obtained, man naturally turns to the *speculative*. Now the mind which, addressing itself to corporeal things, found the various arts of agriculture, building, etc., now forms the art of thinking itself, namely, *logic*, which presupposes grammar for its external manifestation, and is geared for human affairs in rhetoric. This art is called a " liberal " art because it is ordained primarily to the " liberal " or speculative sciences, and is consequently part of the speculative intellect, allied to *science*, with which it may itself be classed.

(6) Logic involves a *formal* and a *material* side, the former concerned with the common *structure* of reasoning, the latter with the different types of *subject-matter*. In this latter realm, *demonstrative* or judicative logic is ordained to science; *dialectical* or inventive logic to contingent things, including human affairs in *rhetoric*, inducement to virtue by representation in *poetics; sophistic* logic is ordained to a study of fallacious reasoning.

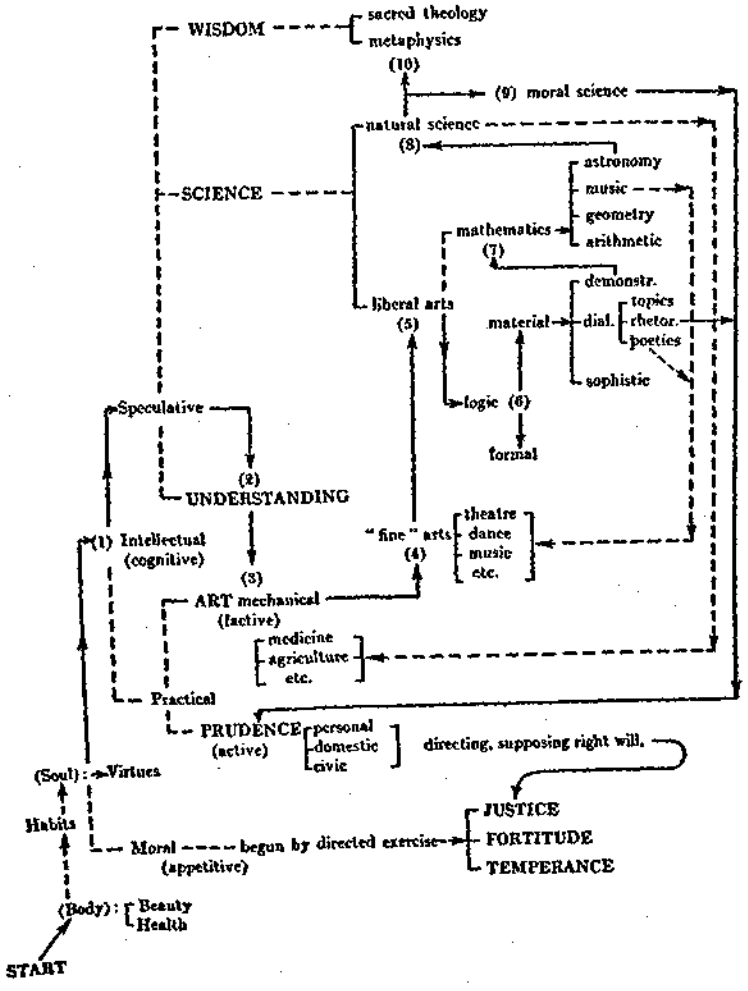
(7) The first application of logic as an art of thinking, to an understanding of the nature of things in science, begins with

that science which is the easiest to grasp as requiring less experience, namely, *mathematics,* which, with its *quadrivium*, succeeding to the *trivium* of logic, is likewise called a "liberal" art. In effect, it is not so much for its own sake as ordained to the knowledge of the nature of things pursued in natural science and metaphysics. Thus arithmetic and geometry are used by natural science and metaphysics in their application to matter in astronomy. Music, while it can be studied as the application of arithmetic to sensible sound (as perspective or drawing may be considered the application of geometry to sensible extension), is, however, more usually to be studied simply as an art of pleasure or relaxation, a "fine" art with an intellectual structure, as well as with moral influence on the passions.

(8) Next in order of the sciences is that whose object is best known, but whose acquisition requires experience of reality, namely, *natural science* (identical for Aristotle and St. Thomas with natural philosophy) of material being. This science leads naturally, in the pursuit of first causes, to the ultimate science, involving immaterial being, and embracing the totality of being and its causes. Natural science may, however, be used in a practical way, supplying principles used in such practical arts as medicine and agriculture. Thus these arts originally acquired by experience, may be further added to by the application of the findings of speculative science.

(9) Man's life cannot be completely speculative, and he must therefore make decisions concerning things to be done, on the personal, domestic, and communal level. This is the realm of *moral science,* which, combined with right will, constitutes the *practical* intellectual virtue of *prudence,* personal, domestic, and civic or political. Prudence dictates the acts of the *moral virtues,* already intended to be imprinted in youths by their exercise under the direction of those in charge of one's upbringing. The role of prudence in general is to ordain their voluntary acts in order to approach as closely as possible to the speculative goal of the knowledge of divine things. Thus

THE ARTS AND SCIENCES



political prudence aims at disposing the state in the practical order in such a way as to make this possible in the speculative order.

(10) The peace and leisure obtained under the ordination of political prudence are intended to render possible the perfection of the speculative life in *metaphysics* or divine science. This highest and ultimate science in the natural order is subordinated in turn to revealed divine science or *sacred theology*. This latter, since its principles are revealed rather than acquired, actually, in its role as supreme science, oversees and directs human activity in all its aspects (whether speculative or practical) from the start. The corresponding speculative intellectual virtue of these ultimate sciences is *wisdom*.

(The above steps regard basically man's *intellectual* development, i. e., of the *cognitive* aspect of his *soul*. Previous to this there is of course first, in the child, care of the *body*. Then, in the *soul*, the imprinting of the *moral* virtues in the *appetitive* part through directed exercise even before the use of reason, precedes the beginning of the *intellectual* virtues, which start when reason begins to function.)

References:

(1) Enumeration of the intellectual virtues and division into speculative and practical:

Summa Theol., I-II, q. 56, a. 3 — I *Metaphys.*, l. 1, no. 34-5
Summa Theol., I-II, q. 57, a. 2-4 — VI *Ethics.*, l. 3, no. 1143 ff.

Further references on the division of intellectual knowledge into *speculative*—truth for its own sake—and *practical*—truth for the sake of operation:

Summa Theol., I, q. 79, a. 11 — III *de Anima*, l. 15, no. 820
Summa Theol., I, q. 14, a. 16 — II *Metaphys.*, l. 2, no. 290
Summa Theol., I-II, q. 94, a. 4 — VI *Ethic.*, l. 2, no. 1152
I *Polit.*, *Prooem.*, no. 6

(2) Understanding as the first habit:

Summa Theol., I-II, q. 57, a. 2 — II *Post. Anal.*, l. 20
VI *Ethic.*, l. 5, no. 1179

(3) Mechanical, or useful, arts are found first:

I *Metaphys.*, l. 1, no. 32-3
I *Metaphys.*, l. 3, no. 57

(4) Subsequently come the arts of pleasure and relaxation:

I *Metaphys.*, l. 1, no. 33
I *Metaphys.*, l. 3, no. 57
X *Ethic.*, l. 9, no. 2077
Summa Theol., II-II, q. 168, a. 2

(5) Then the speculative or liberal arts, as introductory to the sciences:

I *Metaphys.*, l. 1, no. 33
I *Metaphys.*, l. 3, no. 57
II *Metaphys.*, l. 5, no. 335
VI *Ethic.*, l. 7, no. 1211
In de Trin., q. 5, a. 1, ad 3
In de Trin., q. 6, a. 1, ad 3
In Libr. de Causis, Prooem.

(6) Logic is divided into formal and material, and the latter into demonstrative, dialectical and sophistic:

I *Post. Anal.*, l. 1

(7) Logic, or the method of reasoning, is first applied in mathematics:

VI *Ethic.*, l. 7, no. 1208 ff.
In Libr. de Causis, Prooem.
In de Trin., q. 5, a. 1, ad 3
In de Trin., q. 5, a. 1, ad 9
Politics, VIII, 1337b 25 ff.

(8) Next comes natural science, which, though speculative, may be practically applied:

VI *Ethic.*, l. 7, no. 1208 ff.
In Libr. de Causis, Prooem.
In de Trin., q. 5, a. 1, ad 5
VII *Metaphys.*, l. 17, no. 1648

(9) After experience, and exercise in controlling the passions, comes the study of moral science in its threefold division, perfected in prudence, disposing human things for the sake of the divine:

VI *Ethic.*, l. 7, nos. 1200, 1208 ff.
In Libr. de Causis, Prooem.
I *Ethic.*, l. 3, no. 37-41
X *Ethic.*, l. 14, no. 2146-54
Summa Theol., I-II, q. 66, a. 5, ad 1
VI *Ethic.*, l. 6, no. 1185-93
VI *Ethic.*, l. 10, no. 1264-67
I *Ethic.*, l. 2, no. 31

(10) The ultimate science, to which all previous study is ordained, is divine science, natural and revealed:

VI *Ethic.*, l. 7, no. 1208 ff.
In Libr. de Causis, Prooem.
In de Trin., q. 5, a. 4, c.
In de Trin., q. 6, a. 1, ad 3m q.
In de Trin., q. 6, a. 4, obj. 5; ad 3-5
Summa Theol., I, q. 1, a. 4

Remarks:

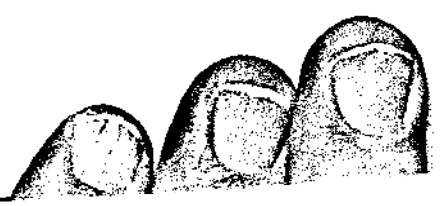
The general division of intellectual knowledge into *speculative* and *practical* may employ the word "theoretical" instead of "speculative," using the Greek rather than the Latin root, but with the same meaning of "seeing" or "contemplating."

The present outline does not contain any distinction between "philosophy of nature" and "physical sciences," since it is intended to represent these matters as considered by St. Thomas, for whom, as is well known, no such distinction exists.[135] Sciences such as the biological sciences would not constitute an additional group, but would simply represent integral parts of a single science, with the exception of *mathematical* natural science, which is formally distinct as a *scientia media*.

Practical knowledge, as to choice of terms, is not divided into "practical" and "productive," since, following St. Thomas, the division here is into "active" and "factive," (Cf. *In Polit., Prooem.*, no. 6; VI *Ethic.*, l. 2, no. 1135; l. 3, no. 1150; l. 4, no. 1165. This corresponds to the division of prudence and art on the basis of *agibile* and *factibile*, or operation remaining within the agent, and operation passing into external matter, in, for example, *Summa Theol.*, I, q. 18, a. 3, ad 1; I-II, q. 57, a. 4, c.; a. 5, ad 1; q. 74, a. 1, c.; I *Ethics.*, l. 1, no. 13; IX *Metaphys.*, l. 2, no. 1786-88; l. 8, no. 1862-65).

"Moral philosophy" is not in this outline divided against "social science," since moral science as understood by St. Thomas, with its threefold division into *ethics* (for a man himself), *economics* or domestic science (for a family), and *politics*

[135] For the textual proof of this point see B. M. Ashley, O.P., "The Role of the Philosophy of Nature in Catholic Liberal Education," *Proceedings of the American Catholic Philosophical Association, XXX* (1956), 62-84.



or civil science (for a whole community in city or state), fully embraces anything considered under what is called "social science." (Cf. for this division in St. Thomas: *Summa Theol.*, II-II, q. 50, aa. 2-3; I *Ethics.*, l. 1, no. 6; VI, l. 7, no. 1200).

Finally, the liberal arts are not placed under practical "arts," but under speculative "science," since St. Thomas specifically refers to them as *speculative* habits, in, for example, *Summa Theol.*, I-II, q. 57, a. 3, ad 3 (*habitus speculativi*); II-II, q. 47, a. 2, ad 3 (*ratio speculativa quaedam facit, puta syllogismum*); and likewise sees no difficulty in their being even *sciences*, as, for example, with respect to logic in III *de Anima*, l. 8, no. 718 (*scientia rationalis*); I *Post. Anal., Prooem.*, no. 2 (*haec ars est Logica, idest rationalis scientia*); IV *Metaphy.*, l. 4, no. 576 (*Dialectica . . . secundum quod est docens . . . est scientia*); with respect to mathematics in VI *Ethic.*, l. 7, no. 1208 (*juvenes . . . ad perfectionem istarum scientiarum pertingentes*); *In de Trin.*, q. 5, a. 1, ad 3 (*mathematica potest sciri a pueris*).

C. *The Neo-Liberal Arts: the Humanities as the new Quadrivium.*

Some years ago Jacob Klein, Dean of St. John's College, Annapolis, in a brilliant lecture argued that as a matter of fact the medieval liberal arts have today been replaced by two arts: "the historical or comparative method," which reigns in literature, philosophy, and in the social sciences in large measure, and the "mathematical or scientific method" which reigns in all other fields. He attempted to trace this new arrangement to Leibnitz' distinction between "facts" and "theories."

Those who advocate that the "humanities" replace the liberal arts seem to think in terms of the same dichotomy.[138] Thus, when Dr. Mullaney speaks of "mathematics and science" as not constituting (liberal) art, he is referring under

[138] On the other hand, Jacques Maritain seems to go to an opposite extreme: "Physics should be taught and revered as a liberal art of the first rank: like poetry, and probably more important than even mathematics." *Education at the Crossroads* (New Haven: Yale University Press, 1943), p. 69. Maritain evidently uses "liberal art" here simply to mean a "liberal discipline."

" mathematics " to arithmetic and geometry, under " science " to music and astronomy, which latter two he has previously reduced to natural science. Since these four are equated to the *quadrivium*, the *quadrivium*, as science masquerading under the title of " liberal arts," must go. In its place now come the " humanities." ". . . We should recognize that history is a liberal art; and further that the humanities, understood as the integrated study of a civilization in its history, philosophy, literature and art, is a liberal art; and that the humanities, grouped around history, make a perfectly sensible content for the *quadrivium*" (p. 45). This author further suggests that " educational practice at the college and university levels has for many years, acted on these two convictions [i. e., that mathematics and science are *not* liberal art, whereas the humanities, grouped around history, *are*] without ever formulating them explicitly " (p. 45). This may well be the case, but the present point at issue is whether, be it in fact or in theory, such an outlook may be considered compatible with St. Thomas. Since *history* is here constituted, more or less, the foundation of the new *quadrivium*—and Dr. Mullaney has indeed established it elsewhere as very much of a liberal art since it is a *reconstruction* (and hence " art ") of a culture, studied *for its own sake* (and hence " liberal ")—it is necessary to consider the place of history in the curriculum of St. Thomas.

It is clear that in the terminology of St. Thomas, " history," or *historia*, refers not to any special *branch* of knowledge, but rather to a *way* of treating *any* branch of knowledge, and which consists in setting down in the beginning of that study whatever has gone before, whether in the nature of inductive facts or in the nature of opinions. Thus, instead of starting out from scratch, so to speak, one starts out with the benefit of the findings of those who have gone before. In this respect, all the works of Aristotle begin with a " history " of previous opinions wherever these exist, as may be seen in the *Physics*, *De Anima*, *Metaphysics*. Is there anything corresponding to what *we* call " history "? The subject-matter which would correspond to what we call " history," and which consists in setting forth the

series of events in the life of a people or peoples, would be, in the educational program of Aristotle and St. Thomas, a prelude to *moral science*, and in particular to *political* science. Thus Aristotle states in the *Rhetoric* (1360a 30 ff.) that the study of the past history of one's own country and of others is the business of political science.

In effect, just as, in endeavoring to determine the nature of the physical universe, one would begin with an examination and appraisal of the solutions to the problem given by one's predecessors, so too, in endeavoring to determine the nature and means of happiness, the goal of man's voluntary endeavors, comprising moral science, it is only natural to examine what others have thought about it and how they have gone about attaining it and with what success. Since man is a social animal and his strivings for happiness and well-being inevitably take a communal form, the examination of those strivings and the means employed will necessarily be a study of whole peoples and their institutions—in a word, history. Such a study is, of course, most apt for one who is himself to be engaged in framing general laws for the community calculated to promote the common well-being, and consequently in his outlining of what a future legislator must have, at the end of the *Nicomachean Ethics*, Aristotle includes the study of previous laws and constitutions of states. He then proceeds to give himself such a history as the starting point of his *Politics*.

Such a course is, in a democracy especially, where all the students are, as future voters, likewise legislators, who can, by their indifference or gullibility, allow the country to fall into evil hands, and contrariwise, by their enlightenment and alertness, ensure sensible legislation, a very vital thing. Since, however, it is in the domain of moral science, where experience is indispensable—for in moral matters one needs to have experience to know what is really good and probable, unexperienced conjectures being likewise unrealistic—such a study of history is not going to be fully valuable unless one has an experiential basis for assessing the feasibility of the courses suggested.[137]

[137] ". . . While collections of laws, and of constitutions also, may be serviceable

St. Thomas stresses the indispensability of experience in this matter as follows:

> . . . Those who have experience concerning individual instances, have the right judgment as to works, and understand by what means and in what ways such works may be accomplished, and what works befit what persons or enterprises. But it is reasonable that it should escape the inexperienced whether a work might be done well or ill from what they find transmitted in writing. For they are ignorant of the application of that which they find written down, to practice. But laws to be made are related to political "works," for they are set up in the manner of rules for political works. Whence those who do not know [by experience] what sort are fitting works, are not able to know what laws are fitting.[118]

From the above it is clear that history so conceived is *not* studied for itself, but as an adjunct of political science, and as part of the preparation for citizenship in a democracy, where the liberal, or free, man is expected to take a part in the government. Even in this role, it is subordinate to, and not a substitute for, experience. However, the vicarious experience of others can certainly contribute to sound prudential judgments either on the personal or on the social scale, and therefore history would be an integral part of the curriculum of St. Thomas as an adjunct of that moral science which consists ideally in perfecting the intellectual virtue of prudence in those who *already* possess by exercise the moral virtues of justice, fortitude and temperance. As both Aristotle and St. Thomas stress, moral teaching has no influence over those who do not have control of their passions,[119] and consequently moral science

to those who can study them and judge what is good or bad and what enactments suit what circumstances, those who go through such collections without a practised faculty will not have right judgment (unless it be as a spontaneous gift of nature) though they may perhaps become more intelligent in such matters" (*Ethics*, X, 1181b 5).

[118] X *Ethic.*, l. 16, no. 2176.

[119] ". . . Words and teaching are not efficacious with all, but it is necessary if they are to be efficacious with someone that the soul of the listener be prepared through many good habits to rejoice in good things and hate evil things. . . . For he who lives according to the passions, does not willingly hear the words of the one admonishing, nor will he even understand, in such a way as to judge that to be good towards which he is being led. Whence no one is able to persuade him" (X *Ethic.*, l. 14, no. 2146).

presupposes, rather than *constitutes*, moral virtue: it is for the sake of teaching one who has hitherto been well directed by others, now to *direct* himself, and others as the case may arise.

Now since prudence is a *practical* intellectual virtue, history, considered as an adjunct of prudence, especially political prudence, cannot be a discipline learned *for its own sake*. In this sense, then, it cannot fulfil Dr. Mullaney's definition of "liberal" and therefore cannot be a liberal art. But what is against studying history for its own sake, studying it in its broadest sense of embracing a whole culture at a given period, comprising the literature, art and philosophy of that time? Thus one might, in a four-year series, study successively 'the classical Graeco-Roman, the medieval Christian, the Renaissance, . . . the contemporary secular culture" (p. 43). There is nothing wrong with it, but neither in the mind of Aristotle nor of St. Thomas would it occupy a very important position. As has been seen, the study of history has a definite role in the practical moral order. In the speculative order, in the order of knowledge of the truth for its own sake, however, it has relatively little. This is summed up in the famous words of Aristotle in the *Poetics*: ". . . Poetry is something more philosophic and of graver import than history, since its statements are of the nature rather of universals, whereas those of history are singulars."[140] What does this mean? It is simply a pointing out of the fact that history is of the contingent singular, in a domain where the law of reason does not necessarily prevail. Consequently, as a means of attaining to a knowledge of the immutable nature of things, leading to first causes, as science, it does not rank high, as may be seen from the great historical variety of opinions on wherein lies right and wrong, on the value of material goods, etc. This also extends to the study of literature and art as a primary means of attaining to the truth in things. Since for certain knowledge one must proceed demonstratively and univocally, and they proceed primarily by metaphor and image, that is not their prime function.[141]

[140] *Poetics*, 1451b 5.

[141] ". . . It seems to be a similar sin if one should take some mathematician using

As has been seen, history in the sense of the study of the customs and evolution of peoples, whether past or present, for the sake of having good laws in one's own community—and which could well be called a study of cultures—does indeed have a significant place in an education following the lead of Aristotle and St. Thomas. It would not, however, be a study of these for their own sake, as is the case with the speculative sciences leading toward first causes. Nor could it be a liberal art leading *towards* speculative science, since its purpose and function, being that of moral science, is not speculative but rather oriented toward practical application.[142] The rather short shrift that one might expect from St. Thomas for the project of studying a culture, not to know "what is the truth," but "what did the people of this culture believe to be the truth" (p. 44), seems to be contained in his comment on the urgency of trying to discover whether Plato's words mean what they seem to mean or something else, namely: ". . . The study of philosophy [i.e., the search for the knowledge of the causes of things] is not for the purpose of knowing what men may have thought, but for the purpose of knowing what is the truth of things."[143]

If one endeavors to understand the substitution of history and the humanities for mathematical and pre-natural science courses as a foundation on which to build a liberal curriculum, in terms of St. Thomas, it seems to connote one thing: the de-emphasizing of the speculative in favor of the practical. In effect, history in its best sense as an auxiliary of moral science, leads to that perfection of moral virtue which may be called

rhetorical persuasions, and should seek from a rhetorician certain demonstrations, such as the mathematician should put forward. For both cases arise from not considering the manner which befits the matter" (I *Ethic.*, l. 3, no. 36).

[142] ". . . It is desirable when making a treatise on such, i.e., on so variable things . . . to show the truth . . . in a rough way, i.e., by applying universal principles and simple things to singular and composite things, which is the area of act. For it is necessary in any operative science that one should proceed in the 'composite' manner. But it is the converse in speculative science, where it is necessary to proceed in the 'resolutory' manner, resolving composite things into simple principles" (I *Ethic.*, l. 3, no. 35).

[143] I *De Caelo*, l. 22, no. 228 (Spiazzi).

active happiness. This happiness is, nevertheless, beneath *speculative* happiness,[144] and therefore the education geared to lead to the latter, as is the liberal education of St. Thomas where the liberal arts are geared to the speculative sciences as the ultimate, is of a superior kind: ". . . The consideration of the speculative sciences is a certain participation of true and perfect happiness." [145]

Is there then no need at all for a reform of the traditional liberal arts, or their adaptation to current needs? To this we should answer that indeed it would be a great mistake today merely to revive the liberal arts as they were actually practiced in the Middle Ages or the Renaissance, and this for two reasons: first, because the theory of the liberal arts as it is given by St. Thomas was never consistently applied in the past; second, because there have been real advances in each of the liberal arts since St. Thomas' time.

As to the first of these points, it is well known, or should be well known, that the so-called "classical education" based on the study of Latin and Greek was in no way a pure application of the medieval conception of the fine arts. The medieval conception, as we have seen, ordered the liberal arts to speculative truth and the contemplative life, and hence made logic the dominant art. The Renaissance tradition was a return to the attitude of the Sophists and of Isocrates, and of the Ciceronians, which ordered these arts to the practical life of the public official and the liberal active life, and hence made rhetoric the dominant art. Even in the study of rhetoric this

[144] ". . . (Aristotle states) that while he who devotes himself to the speculation of truth is the most happy, in a secondary way he is happy who lives according to another virtue, namely, according to prudence, which directs all the moral virtues. For just as speculative happiness is attributed to wisdom, which comprehends within itself the other speculative habits as being the more dominant among them, so likewise active happiness, which is according to the operations of the moral virtues, is attributed to prudence, which is perfective of all the moral virtues, as was shown in Book VI" (X *Ethic.*, l. 12, no. 2111).

[145] *Summa Theol.*, I-II, q. 3, a. 6, c.; q. 57, a. 1, ad 2. Cf. II-II, q. 182, a. 1, c., where St. Thomas in proof of the proposition that "the contemplative life is absolutely better than the active," cites the eight reasons Aristotle gives for the superiority of speculative happiness in *Ethics* X.

classical tradition quickly degenerated. The art of rhetoric ceased to be an art of persuasion instrumental to politics, and became a mere art of " style," so that the sterile study of grammar came to dominate education.[146]

Even in the Middle Ages the theory of St. Thomas was not the dominant view. In the earlier Middle Ages there was a tendency to identify the arts with philosophy, so that the *quadrivium* took the place of natural science (an identification found in current expositions, as we have seen), while ethics and metaphysics were absorbed into sacred theology. In the late Middle Ages the tendency was to an exaggerated development of the dialectical and grammatical aspects of logic, but with little appreciation of its poetic and rhetorical side. There was a tendency, noted by Roger Bacon, to neglect the development of mathematics, and the study of languages, which later gave a handle to the accusations of the Renaissance rhetoricians that the writers of the Middle Ages were logic-choppers with hearts of lead and tongues of iron.

What is required today is the application of the theory of St. Thomas that clearly distinguishes the speculative sciences from the liberal arts, which are only introductory, and that at the same time gives to the liberal arts their full range including poetics, rhetoric, dialectics, demonstrative logic, pure and applied mathematics.

As to the development of these arts since medieval times, it is plain also that the sound theory of each art as developed by Aristotle needs to be enriched with modern developments. Thus " grammar " needs to be taught so as to make use of the modern development of scientific linguistics and " communication theory." [147] Poetics, functioning in literary criticism, needs to be given a rightful place, as Aristotle intended, and not to be confused with a mere grammatical analysis of a text, as in " classical " education. Logic must be distinguished into its

[146] See Richard P. McKeon, " Rhetoric in the Middle Ages," *Speculum*, XVII (1942), 1-32.

[147] But see Leonard A. Waters, " Progressivist Attack on Grammar," *America*, April 12, 1958, pp. 56-58, for some dangers in the pedagogical application of structural linguistics.

dialectical and its demonstrative parts, and the techniques of logical calculus which we call "symbolic logic" must be given their proper instrumental role. Furthermore, the very considerable development of dialectics as it is used in what we today call "the scientific method" of hypothetical "theory construction" must be recognized.

As for rhetoric, the discoveries of "propaganda analysis," "mass communication techniques," "motivational research," etc., should be utilized. Along with rhetoric and dialectic the meaning of "the historical method" and the techniques of description devised by the social sciences need to be treated, since through these instruments we are able to write and present history much more accurately and artfully than ever before.

In the *quadrivium* remarkable advances have been made in mathematics. The "traditional" teaching of algebra has neglected the axiomatic method which makes mathematics both a true art and a true science, while Euclid's geometry has been very greatly improved by a more perfect employment of this method. Today, one claims, it is possible to teach even elementary mathematics in terms of *set-theory* in a way which makes it a much more perfect example of scientific thinking than in its ancient formulation. Furthermore, the development of the theory of mechanics in mathematical physics since Galileo, makes it possible for us to present applied mathematics in a fashion far superior to the meager achievements of the ancients.

At the same time that we enrich the liberal arts with modern advances, however, we must be very careful to see that we present these arts on a sound Aristotelian basis. In each field of art there exist today many very divergent views and much confused or erroneous doctrine. In the field of mathematics, for example, the *logicist*, *formalist*, and *intuitionist* schools are divided on the various principles of their science. If we teach a *logicist* mathematics we will teach our students that the *quadrivium* and *trivium* are identical with each other. If we teach a *formalist* mathematics we will deny that mathematics is a science at all, and turn it into an art which has no purpose, a mere game, with the risk of inculcating a deep scepticism in

young minds. If we teach the *intuitionist* approach we are likely to infect our students with certain Kantian assumptions.

Similarly in the field of logic an uncritical presentation of the modern system of symbolic logic means that we indoctrinate our students with nominalism. An uncritical presentation of the modern "motivational research" approach to rhetoric will make them Machiavellians. An uncritical presentation of the "scientific method" in dialectics will make them relativists. And finally an uncritical presentation of poetics and theory of the fine arts in terms of modern "symbolism" will make them irrationalists and pseudo-mystics.

Nothing will do but a revival of the liberal arts, firmly grounded and richly developed. We may recall the words of Leo XIII in *Aeterni Patris*:

> When philosophy stood stainless in honor and wise in judgment, then, as facts and constant experience showed, the liberal arts flourished as never before or since; but, neglected and almost blotted out, they lay prone since philosophy began to lean to error and join hands with folly.

The principle which Leo recommended to give a firm foundation to such a revival was the Thomistic conviction that the liberal arts and all the sciences to which they lead are directed toward wisdom, and not to mere technical control or "creative self-expression."

In closing one cannot help but observe again the striking fact that it is in following the speculatively-orientated curriculum of St. Thomas, where the core is constituted by the natural sciences leading to divine science, that one would—in contrast to a humanities-orientated curriculum—find oneself also in complete accord with the curriculum now being urged most pressingly for motives of survival, wherein mathematics and natural science likewise occupy a central position. If this curriculum of St. Thomas is not at present anywhere genuinely followed, it need not be because it is seven hundred years too late—it may simply be that it is still just a year or so too soon.

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